

# **LECTURE NOTES**

*Theory without practice is pointless. Practice without theory is mindless.*

- I. Auditing**
- II. Accounting**
- III. Economics**
- IV. Finance**
- V. Econometrics**
- VI. Business**
- VII. Information Technology**

As the countryman also serves as the foreign worker, the forehead, and the fist through his work in the grossly rich motherland to rebuild our land, and the battle for the vital prerequisites for a happy future and welfare of the people in the motherland's space. The Work Abroad current task, and that this distinction will always be. This thinking is based on his use, his work, and his personal maintenance. He whom possesses, the general representative for the work.

**Suggested Styles: Econ 132; Econ 101; Psyc 250; Psyc 230; Arab 101; Econ ; ISM ; Busi ; Acc**

**I. Auditing**

- I. CIA/IIA I
- II. CIA/IIA II
- III. AICPA/CMA
- IV. CFSA—Financial Services

**II. Accounting**

- I. Financial Accounting
- II. Management Accounting
- III. Regulation
- IV. Taxation

**III. Economics**

- I. Microeconomics
- II. Macroeconomics
- III. Monetary Economics
- IV. International Economics

**IV. Finance**

- I. General Finance Theory
- II. Corporate Finance
- III. International Finance
- IV. Financial Instruments
- V. Financial Services

**V. Econometrics**

- I. Probability
- II. Cross-Sectional
- III. Time Series
- IV. Regression Techniques

**VI. Information Technology****VII. Business Strategy~~Processes**



# Auditing

## **I. CIA I- Internal Audit Activity's Role in Governance, Risk, and Control**

### **I. Comply with IIA's Attribute Standards**

1000: Purpose, Authority, and Responsibility

Internal Audit Charter

1100: Independence and Objectivity

1200: Proficiency and Due Professional Care

1300: Quality Assurance and Improvement Program

IIA's Code of Ethics

### **II. Managing the Internal Audit Activity**

2010: Planning

2030: Resource Management

2060: Reporting to Board and Senior Management

2020: Communication and Approval

2040: Policies and Procedures

2050: Coordination of Activities

SOX

### **III. Nature of the Internal Auditor's Work**

2110: Risk Management

2130: Governance

### **IV. Control**

Systems of Control

Means of Achieving Control

Control Techniques

Control Implications of Organisational Structure

Leadership

Negotiation and Conflict Management

Change Management

### **V. Engagement Planning**

2210: Engagement Objectives

2220: Engagement Scope

2230: Engagement Resource Allocation

2240: Engagement Work Program

Preliminary Survey

2340: Engagement Supervision

Engagement Procedures

Fraud

## **II. CIA II- Conducting the Internal Audit Engagement**

### **I. Conducting and Monitoring Engagements**

Engagement Information

Communicating the Results

Engagement Staff Performance Appraisals

Monitoring Progress- Standard 2500

### **II. Types of Internal Audit Services**

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Variance Analysis

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The Decision-Making Process

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## **III. AICPA- CPA Auditing and Attestation**

### **I. Introduction and General Field Standards**

Introduction

Decision to Accept a Client

Document Engagement Understanding

Planning the Engagement

Review and Evaluation of the Internal Control Structure

Consideration of Fraud in Financial Statements

Illegal Acts by Clients

Auditor's Consideration of Internal Audit Function

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The Auditor's Report

The First Standard of Reporting

The Second Standard of Reporting

The Third Standard of Reporting

The Fourth Standard of Reporting

Other Reporting Considerations

Using the Work and Reports of Other Auditors

Other Information in Documents Containing Audited Financial Statements SAS 8

Reports on Comparative Financial Statements SAS 58

Association with Financial Statement SAS 2

Reporting on Condensed Financial Statements and Selected Financial Data

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Single audit act

System of quality control for a CPA firm's accounting and auditing practice

Monitoring a CPA firm's accounting and auditing practice

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Compilation Engagements and Review Engagements- Non-Public Companies

Reporting on Comparative Financial Statements, Compilation and Review Engagements- Non-Public Companies

Compilation Reports on Financial Statements Included in Certain Prescribed Forms- Non-Public Companies

Communications Between Predecessor and Successor Accountants- Non-Public Companies

Review of Interim Financial Information- Public Companies

Special Reports

Reports on the Application of Accounting Principles

Reporting on Financial Statements Prepared for use in Other Countries

Reporting on Information Accompanying the Basic Financial Statements in Auditor-Submitted Documents

Letters for Underwriters and Certain other Requesting Parties

#### **VI. The Audit Sampling Process**

Audit Sampling Defined

Types of Sampling

Glossary of Sampling Terms

Sampling in Tests of the Internal Control Structure

Sampling in Substantive Tests of Details

Application of Statistical Sampling in the Audit Process

Audit Sampling

Audit Risk and Materiality in Conducting an Audit

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Auditing a Computer System Without Using the Computer  
Reports on the Processing of Transactions By Service Organizations  
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Flowcharting Symbols

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IIA Professional Practices Framework  
Internal Control/Risk Management/Governance  
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10. Financial Accounting of Liabilities and Equity
11. Bonds
12. Financial Statement Analysis
13. Basic EPS
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15. Financial Structure
16. Long Term Financing
17. Capital Structure
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21. Accounting for Investments
22. Business Combinations
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28. Accounting for Foreign Operations
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1. Concepts and Standards for Financial Statements

#### II. Typical Items:

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3. Cash, Cash Equivalents, and Marketable Securities

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### **III. Specific Transactions**

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7. Financial Instrument
8. Foreign Currency Transactions and Translation
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2. COGS/COGM
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7. Joint Products
8. By-Products
9. Variable and Absorption Costing
10. Variance Analysis
11. Capital Budgeting
12. Present Value and Future Value of Money
13. Capital Budgeting Methods
14. Discounted Cash Flow Methods
15. Capital Rationing in Capital Budgeting
16. Budgeting
17. Transfer Pricing
18. Relevant Information for Decision-Making
19. Marginal Analysis

20. Cost-Volume-Profit (CVP) Analysis
21. Breakeven Analysis when More than 1 Product is Sold
22. CVP and Conditions of Risk and Uncertainty
23. Responsibility Centres and Responsibility Accounting

### **III. Regulation**

#### **I. Business Law Ethics and Professional Responsibilities**

1. Contracts
2. Sales
3. Secured Transactions
4. Negotiable Instruments
5. Documents of Title
6. Agency
7. Bankruptcy
8. Surety and Debt Collections Remedies
9. Property
10. Insurance
11. Securities Acts and Antitrust Regulations
12. Regulation of Employment
13. Accountant's Legal Liability
14. Professional Responsibility

#### **II. Government Legislation**

1. Government Regulations
2. Government and the Economy
3. Monetary Policy
4. Money Supply
5. Fiscal Policy
6. Government Funding
7. International Business Law
8. Forms of Business Organization
9. Contract Law
10. Legal Evidence

### **III. Laws/Regulations and Regulatory Environment**

#### **I. US**

1. Overview of the Regulatory Environment
2. Laws and Regulations
3. Stock Exchanges and Other Markets

#### **II. Canada/SA/UK/ Australia**

1. Overview of the Regulatory Environment
2. Laws and Regulations
3. Stock Exchanges and Other Markets

## **IV. Taxation**

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Filing Status and Exemptions, Filing Requirements and Penalties

Accounting Methods & Periods, and Computations of Tax Liability & Tax Credits

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Taxation of Gifts, Estates and Fiduciaries, and Exempt Organizations

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Deductions for Adjusted Gross Income

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Distributions, S Corporations and Other Corporate Matters

Corporate Distributions and Other Matters

S Corporations

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## I. Microeconomics

### I. Markets and Prices

Preliminaries

Basics of Supply and Demand

### II. Producers, Consumers, and Competitive Markets

Consumer Behavior

Individual and Market Demand

Choice Under Uncertainty

Production

The Cost of Production

Profit Maximization

The Analysis of Competitive Markets

### III. Market Structure and Competitive Strategy

Market Power: Monopoly and Monopsony

Pricing with market Power

Monopolistic Competition and Oligopoly

Game Theory and Competitive Strategy

Markets for Factor Inputs

Investment, Time, and Capital Markets

### IV. Information, Market Failure, and the Role of the Government

General Equilibrium and Economic Efficiency

Markets with Asymmetric Information

Externalities and Public Goods

## II. Macroeconomics

### I. Introduction

The Science of Macroeconomics

The Data of Macroeconomics

### II. Classical Theory: The Economy in the Long Run

National Income: Where it Comes From and Where it Goes

Money and Inflation

The Open Economy

Unemployment

### III. Growth Theory: The Economy in the very Long Run

Economic Growth I

Economic Growth II

### IV. Business Cycle Theory: The Economy in the Short Run

Introduction to Economic Fluctuations

Aggregate Demand I

Aggregate Demand II

Aggregate Demand in the Open Economy

Aggregate Supply

### **V. Macroeconomic Policy Debates**

Stabilization Policy

Government Debt

### **VI. More on Microeconomics Behind Macroeconomics**

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Money Supply and Money Demand

Advances in Business Cycle Theory

## **III. Monetary Economics**

### **I. Fundamentals of Monetary Theory**

Currency in an Island Economy

The Monies of a Modern Economy

The Demand for Money

Stock and Bond Valuation and the Term Structure of Interest Rates

### **II. Fundamentals of Monetary and Financial Institutions**

Financial Intermediation

Financial Institutions

The Money Supply Process

Institutions of Monetary Control: Historical Role of the Federal Reserve in the US

### **III. Equilibrium Analysis**

Full Employment and Monetary Policy Neutrality

Economic Fluctuations and Monetary Accommodation

Stabilisation Policy when Firms Set Prices in Advance

Stabilisation Policy in the Presence of Long-Term Nominal Wage Contracts

### **IV. Descriptive Dynamics and Inflation**

A Critique of Stabilisation Policy

Monetary Rules

Inflation and Seigniorage: What is Optimal?

### **V. The Mechanics of Policy and Policy-Making**

Optimal Targeting and the Response of Financial Markets

Desk Operations and the Repo Market for Treasuries

Time Inconsistency and the Credibility of Monetary Policy

## **IV. International Economics**

### **I. International Trade Theory**

Introduction

World Trade: An Overview

Labor Productivity and Comparative Advantage: The Ricardian Model

Resources, Comparative Advantage, and Income Distribution

The Standard Trade Model

Economies of Scale, Imperfect Competition, and International Trade

International Factor Movements

## **II. International Trade Policy**

The Instruments of Trade Policy

The Political Economy of Trade Policy

Trade Policy in Developing Countries

Controversies in Trade Policy

## **III. Exchange Rates and Open-Economy Macroeconomics**

National Income Accounting and the Balance of Payments

Exchange Rates and the Foreign Exchange Market: An Asset Approach

Money, Interest Rates, and Exchange Rates

Price Levels and the Exchange Rate in the Long Run

Output and the Exchange Rate in the Short Run

Fixed Exchange Rates and Foreign Exchange Intervention

## **IV. International Macroeconomic Policy**

The International Monetary System, 1870-1973

Macroeconomic Policy and Coordination Under Floating Exchange Rates

Optimum Currency Areas and European Experience

The Global Capital Market: Performance and Policy Problems

Developing Countries: Growth, Crisis, and Reform

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## I. General Finance Theory

### I. Fundamental Concepts of Financial Management

Money and Banking  
 The Investment Environment  
 Time Value of Money  
 Asset Classes and Financial Instruments  
 How Securities are Traded  
 Mutual Funds and Other Investment Companies

### II. Portfolio Theory and Practice

Learning about Return and Risk from the Historical Record  
 Risk Aversion and Capital Allocation to Risky Assets  
 Optimal Risky Portfolios  
 Index Models

### III. Equilibrium in Capital Markets

The Capital Asset Pricing Model  
 Arbitrage Pricing Theory and Multifactor Models of Risk and Return  
 Efficient Market Hypothesis  
 Behavioural Finance and Technical Analysis  
 Empirical Evidence on Security Returns

### IV. Applied Portfolio Management

Portfolio Performance Evaluation  
 International Diversification  
 Investment Policy and Framework of the CFA Institute  
 Theory of Active Portfolio Management

## II. Corporate Finance

### I. Projects and their Valuation

The Cost of Capital  
 The Basics of Capital Budgeting: Evaluating Cash Flows  
 Cash Flow Estimation and Risk Analysis  
 Real Options

### II. Corporate Valuation and Governance

Financial Planning and Forecasting Financial Statements  
 Corporate Valuation, Value-Based Management, and Corporate Governance=

### III. Strategic Financing Decisions

Capital Structure Decisions

### IV. Tactical Financing Decisions

Initial Public Offerings, Investment Banking, and Financial Restructuring  
 Lease Financing  
 Hybrid Financing: Preferred Stock, Warrants, and Convertibles

### V. Operational Hedging



Working Capital Management  
 Derivatives and Risk Management

### **VI. Legal Manipulation**

Bankruptcy, Reorganization, and Liquidation  
 Mergers, LBOs, Divestitures, and Holding Companies

### **VII. Ratio Analysis**

## **III. International Finance**

### **I. International Financial Environment**

Multinational Financial Management  
 International Flow of Funds  
 International Financial Markets  
 Exchange Rate Determination  
 Currency Derivatives

### **II. Exchange Rate Behaviour**

Government Influence on Exchange Rates  
 International Arbitrage and Interest Rate Parity  
 Relationships among inflation, interest rates, and exchange rates

### **III. Exchange Rate Risk Management**

Forecasting Exchange Rates  
 Measuring Exposure to Exchange Rate Fluctuations  
 Managing Transaction Exposure  
 Managing Economic Exposure and Translation Exposure

### **IV. Long-Term Asset and Liability Management**

Direct Foreign Investments  
 Multinational Capital Budgeting  
 International Acquisitions  
 Country Risk Analysis  
 Multinational Cost of Capital and Capital Structure  
 Long-Term Financing

### **V. Short-Term Asset and Liability Management**

Financing International Trade  
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## **IV. Financial Instruments**

### **I. Securities and their Valuation**

Bonds, Bond Valuation, and Interest Rates  
 Risk, Return, and Capital Asset Pricing Model  
 Portfolio Theory and Other Asset Pricing Models  
 Stocks, Stock Valuation, and Stock Market Equilibrium  
 Financial Options and Applications in Corporate Finance

### **II. Fixed Income Securities**

Bond Prices and Yields

The Term Structure of Interest Rates

Managing Bond Portfolios

### **III. Security Analysis**

Macroeconomic and Industry Analysis

Equity Valuation Models

Financial Statement Analysis

### **IV. Options, Derivatives, and Futures**

Options Markets: Introduction

Option Valuation

Futures Markets

Futures and Swaps: Markets and Applications

### **V. Classes of Financial Instruments**

## **V. Financial Services**

### **I. Banking**

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### **II. Insurance**

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Processes

### **III. Securities**

Products

Processes

### **IV. Regulation**

Banking

Securities

Insurance

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- I. Probability**
- II. Cross-Sectional**
- III. Time Series**
- IV. Regression Techniques**

# **Information Technology**

# **Business Strategy~~Processes**

- I. Management**
- II. Marketing**
- III. Ethics**

# Auditing

**Auditing**

- I. CIA/IIA I**
- II. CIA/IIA II**
- III. AICPA/CMA**
- IV. CFSA—Financial Services**

## **I. CIA I- Internal Audit Activity’s Role in Governance, Risk, and Control**

### **I. Comply with IIA’s Attribute Standards**

1000: Purpose, Authority, and Responsibility

Internal Audit Charter

1100: Independence and Objectivity

1200: Proficiency and Due Professional Care

1300: Quality Assurance and Improvement Program

IIA’s Code of Ethics

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2010: Planning

2030: Resource Management

2060: Reporting to Board and Senior Management

2020: Communication and Approval

2040: Policies and Procedures

2050: Coordination of Activities

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### **III. Nature of the Internal Auditor’s Work**

2110: Risk Management

2130: Governance

### **IV. Control**

Systems of Control

Means of Achieving Control

Control Techniques

Control Implications of Organisational Structure

Leadership

Negotiation and Conflict Management

Change Management

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 Communicating the Results  
 Engagement Staff Performance Appraisals  
 Monitoring Progress- Standard 2500

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Assurance Services  
 Performance Engagements  
 Consulting Services  
 Fraud Engagements  
 Control Self-Assessment  
 Information Technology IT

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Sampling Fundamentals  
 Probability  
 Data Gathering Tools  
 Analytical Review Techniques  
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 Other Reasonableness Tests  
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Implications of Information Technology  
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##### **II. Auditing Financial Services Products**

##### **III. Auditing Financial Services Processes**

Risk Management  
Underwriting

# **Internal Audit Activity's Role in Governance, Risk, and Control**

***CIA I***



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# **I. Comply with IIA's Attribute Standards**

- internal auditing began in China times, then industrial revolution
- internal v. external auditing
- internal auditing includes: **internal audit activities, assurance services, and consulting services**

### **IIA continuous promotion**

1. adopt a common body of knowledge
2. professional practices framework
3. publish technical journal
4. offer certification program
5. administer continuing professional education

### **4 purposes of professional standards**

- 1) delineate basic principles
- 2) provide framework for internal audit
- 3) establish performance evaluation
- 4) foster improved processes

#### **A. Attribute standards**

- 1) purpose, authority, and responsibility
- 2) independence and objectivity
- 3) proficiency and due professional care
- 4) quality assurance and improvement program

#### **B. Performance standards**

- 1) managing the internal audit activity
- 2) nature of work
- 3) engagement planning
- 4) performing the engagement
- 5) communicating the results
- 6) monitoring progress
- 7) resolution of management's acceptance of risks

#### **C. Implementation standards**

##### **Professional practices framework**

- 1) Internal auditing standards board IASB
- 2) International ethics committee
- 3) Board of regents
- 4) Professional issues committee
- 5) Executive committee
- 6) Administrative directives

**1000: Purpose, authority, and responsibility**

- established by the board and management
- to assist management in carrying out its monitoring activities effectively and efficiently
- objective: promote effective control at a reasonable cost
- report to board of directors via audit committee
- must have top support to get full cooperation
- must have organizational independence and necessary status

**A. The internal audit charter**

- gives the IA formal mandate to work; comes from top management
- defines scope, objective, authority, responsibility, and accountability
- CAE reports to CEO, independent level
- well-written charter is very important, but not unchanging
- should be reviewed at least annually

**B. The audit committee**

- subcommittee of the board- 3-9 members; external directors
- certain powers, duties, and responsibilities pertaining to external and internal auditing

**C. Consulting services**

- counsel, advice, facilitation, process designing, and training
- \***consulting engagement**- may be formal or informal, connected to assurance engagement or not
- \***assessing engagement**- for risk management, control or governance processes; financial performance, compliance, systems security, due diligence
- value is added by IAA by performing consulting and assurance services; rules should be included in charter; must not impair objectivity

**1100: Independence and objectivity**

- impossible to be independent like external auditors, so must be objective
- IAA must be independent within the organization
- organizational status determines independence

**1110: Organizational independence**

- \***functional reporting**- audit committee; ultimate source of independence and authority for the IAA
- \***administrative reporting**- CEO; reporting relationship with the organization's management structure that facilitates the day-to-day operations of the IAA

**1120: Individual objectivity**

- should be impartial, have an unbiased attitude, and avoid conflicts of interest
- IAA making recommendations as part of a consulting project does not impair objectivity in respect to a financial audit

**1130: Impairments to independence or objectivity**

- when conflict of interest arises, CAE is notified and reassignment occurs
- \***conflict of interest**- a relationship not in the best interest of the company
- impairment arising during engagement must be immediately addressed
- not impaired when auditor *recommends* standards systems, but is if he designs, installs, drafts procedures, or operates such systems
- 1 year rule: forward and backward for objectivity impairment
- can provide consulting services in areas they had previously worked

### ***1200: Proficiency and due professional care***

- engagements should be performed with proficiency and due professional care

### **1210: Proficiency**

- skills needed for proficiency depend on work type: financial statements needs GAAP
- understanding of management principles is needed for all auditors
- \***appreciation**- being aware of the problem
- \***understanding**- being able to figure out the impact of the problem on operations
- \***proficiency**- solving the problem
- education, experience, and communication are also important

### **Obtaining services to support or complement the internal audit activity**

- if skills are present in house, either go external or decline engagement
- CAE examines the skills of the expert, or someone else with sufficient experience and understanding to review the work
- external auditor could be an expert, but could not impair his financial statement evaluation objectivity; these experts from the engagement client will almost never be used

### **1220: Due professional care**

- means that the internal auditors apply the skill and care expected of a reasonably prudent and competent internal auditor
- examine more material items more
- should utilize assurance procedures to help identify and eliminate risk

### **1230: Continuing professional development**

- must do CPE

### ***1300: Quality assurance and improvement program***

- CAE should develop and maintain a QAIP

### **1310: Quality program assessment**

- CAE responsible for implementation, monitoring, and assessment of the program; should include both internal and external assessments
- purpose is for the top stakeholders to feel comfortable with the services the IAA is contributing to the organization

**\*quality circle-** group of employees, from 5 to 15 to advise on issues; frequently use benchmarking (best practices); get a competitive advantage; use best company in any industry; efficiency procedures, not products

-main problem: quality can mean different things to different people

### **1311: Internal assessments**

-internal reviews carried out periodically; costs lower than external, but may not be as rigorous since insiders are doing it

**\*ongoing review** of performance of internal audit activity- conclusions and follow ups that should be taken to ensure appropriate improvements are being implemented

**\*periodic review** of the program from an independent person within the organization familiar with the program- asses compliance with the activity's charter, the Standards, the Code of Ethics, and the efficiency and effectiveness of the IIA in meeting the needs of its various stakeholders

### **1312: External assessments**

-opportunity to provide an independent assurance of audit quality to the CAE and everyone else; once every 5 years; internal assessment waived when done

-higher cost but more independent; less rigorous for financial data because outsiders can't see that

### **1320: Reporting on the quality program**

-at conclusion of assessment, report on whether or not the IIA activities are in compliance with the appropriate standards; normally delivered to CAE, but if CAE incompetent, send copy to board as well

### **1330: Use of conducted in accordance with the standards**

-only if quality assessments demonstrate that the internal auditors are in compliance with the standards

-in compliance, in conformance, in accordance

### **1340: Disclosure of noncompliance**

-if noncompliance impacts the overall scope of the operation, a disclosure of noncompliance should be issued to the board; for whatever reason,

### **Code of ethics**

-purpose of internal auditing activity is to be an independent, objective assurance and consulting activity designed to add value and improve operations

IIA code of ethics is the ethical guide of conduct for internal auditors

#### **1. Applicability and Enforcement**

-applies to both individuals and entities providing internal auditing services

-breaches of the Code will be evaluated and administered according to the bylaws

-rule does not have to be stated to be clearly wrong

#### **2. Principles/Rules of conduct**

1. Integrity

2. Objectivity

3. Confidentiality
4. Competency

## II. Managing the Internal Audit Activity

-main topics: planning and communications, resource management, policies and procedures, coordination

### **2000 Managing the internal audit activity**

-CAE effectively manage IIA to ensure it adds value to organization; manage the internal audit activity staff  
-fulfills purposes, efficiently use resources, conform to standards

### **2010 Planning**

-CAE establish risk-based plans to determine IIA priorities and ensure conformance with firm's goals

#### **1. Goals**

-achievable, measurable, within realm of firm,

#### **2. Engagement Work Schedules**

-important at larger IIA level and at individual level  
-what, when, time required, and priority

#### **Determining which engagements to conduct**

-must consider risk of each foremost  
length, requests, relation, changes in circumstances and risk, benefits, personnel skills  
-risk assessment is most important: quantitative and qualitative  
-multiply dollar risk at loss and % chance  
-control risk procedures as well as monetary

#### **3. Staffing plans and financial budgets**

#### **4. Activity reports**

#### **Long term planning**

-ensure all areas of business are audited periodically  
-make complete arrangements for all audit areas

### **2030 Resource management**

-CAE ensures audit staff is professional; right people in the right positions  
-better to be understaffed than have the wrong people  
-resources are appropriate, sufficient, and effectively deployed  
-long term view to positions: grow the staff  
-consider for assignments: complexity, resources available, experience level, training and developmental needs

### **Recruiting and Promoting**

- recruit qualified staff and keep them: CAE and HR
- hiring: education and experience, communication skills, interpersonal skills
- HR issues: promotion and filling spots: internal (quicker, less risky) or external (new ideas, training time)
- job descriptions established for all persons: necessary skill sand requirements for the position; allows CAE to determine if IIA is properly staffed, training and new additions

### **Training, Staff development and performance evaluations**

- CAE responsible for training, counselling, mentoring, and performance evaluations
- personal desires considered slightly; training should help both people and IIA
- performance evaluations at least annually: include time for preparation for both sides; be very clear and give examples

### **2060 Reporting to board and senior management**

- report periodically to the board on the IAA: include risk issues

#### **Activity reports**

- submit activity reports at least once a year, or more if necessary
- be: communicated in writing, highlight significant engagement observations that could adversely affect the organization, identify recommendations, compare engagements, compare performance compare expenditures
- not too long, simple list is fine
- management's responsibility to take action
- gut call to report previously uncorrected conditions

#### **Relationship with audit committee**

- should revolve around the CAE gets all assistance and such from the audit committee
- synergy from: board of directors, management, internal and external auditors
- communications with audit committee is imperative

### **2020 Communication and approval**

- CAE ensures plan and resource requirements are communicated to senior management and board for review and approval

### **2040 Policies and procedures**

- CAE establishes policies and procedures to guide the IAA and individual auditors in their work
- more developed policies needed in large IAAs

### **2050 Coordination of activities**

- CAE must share information and coordinate activities with others to ensure no duplication and proper coverage: external auditors, government boards, assurance functions

**Coordination with external auditor-** increase efficiency and reduce costs; strong internal audit reduces need for external audit, many external auditors becoming internal

**Assistance provided by internal auditor-** area CAE most interested in; can reduce costs by doing testing and providing support for the external auditor; external must assess competence and objectivity of the internal



**Assistance provided by external auditor-** CAE may use work from the external auditor to lessen his duties

**Control and use of the auditor's working papers-** could be an issue over who controls them; whoever prepared them owns them; copies can be provided however

**\*working papers** - contain all the work and tests performed during an engagement and they will be the basis for any conclusion drawn by the internal auditor

**Coordination with regulatory bodies-** some industries have stricter guidelines: banks, insurance, power companies

**Coordination with other internal assurance functions-** multiple departments concerned with control: security department, quality control department, safety and health, industrial engineering

## **SOX**

**Purposes:** improve quality and transparency of financial reports, enhance standard setting process, strengthen firm independence, increase corporate responsibility, protect objectivity and independence of security analysts

Internal control provisions: audit committees are to be directly responsible for the selection of accounting firm; audit committees need proper funding; auditors report directly to audit committee; audit committee independent; audit committees adopt written guidelines; cannot manipulate audit records; management statement claiming responsibility; have code of ethics for senior officers

# III. Internal Audit Activity's Role and Responsibility in Risk Management and Governance

- IAA must evaluate and improve processes; essential for reasonable assurance operations are proceeding efficiently and economically
- main goals: management established goals and objectives, management designs and plans risk management, management directs these processes, IAA evaluates and improves these processes

## **2100 Nature of IA work**

- IAA must evaluate and contribute to the improvement of risk management, control and governance processes using a systematic and disciplined approach in all areas of the business
- improve adequacy and effectiveness of business processes
- efficiency(time/accurate), economically(money), and effectiveness(completeness)
- management is accountable for: sustainability of whole organization, accountability for organization's actions, conduct and performance to owners, regulators, and public
- \***preventative controls**- to deter undesirable events from occurring
- \***detective controls**- to detect and correct undesirable events which occurred
- \***directive controls**- to cause or encourage a desirable event to occur

## **Information security**

- management's responsibility to ensure controls are efficient; IA just reports on conditions; preventative and detective controls

## **Internal audit's role in the risk management process**

- assessment and reporting of risk management processes are high priority
- role of IAA in risk management depends on: culture, country, ability
- address risk issues immediately

## **Internal audit's role in organizations without a risk management process**

- bring it to management's attention and suggest solutions
- not IAA's responsibility to establish a risk management process
- IAA play a helping role, but management must design it to ensure IAA independence; the charters should clearly define responsibilities

### **Legal considerations in evaluating regulatory compliance programs**

- organization should develop a written code of conduct that provides guidance for adherence to legal issues
- should be an organizational chart that describes whom is responsible for what
- enforced in same manner, communicated to all, training when necessary
- violations of code documented

### **Control and audit implications of e-commerce activities**

- assess structure, assurance, information flow, interface issues, business continuity and disaster recovery plans
- maintenance of systems, specific security risks (viruses), website content review, technology changes, legal issues
- unauthorized transfer of money, duplication of payments, denials of orders, exception reports, digital signatures, hackers and viruses, access rights, IP history

### **Internal audit's role in identifying and reporting environmental risks**

- could be a separate environmental reporting function; larger companies
- risk assessment of environment, health, and safety

### **Internal auditor's role in evaluating an organization's privacy framework**

- physical security of information and privacy of people's information
- \***privacy**- includes individuals' rights to be left alone and for any pertinent information of an individual not to be disclosed by other parties that happen to possess such information
- information is not disseminated to the wrong individuals
- \***privacy vulnerabilities**- embarrassment, inconvenience, unfairness, lawsuits, penalties, fines, negative goodwill
- no guaranteed security
- country specific laws: be aware, ensure compliance, work with IT, confer with counsel

### **2110 Risk Management**

- assess exposures to risk and contribute to risk management improvement
- \***risk**- the probability that some future event or action could adversely impact the organization; risk is measured in terms of impact (dollars) and likelihood (probability)
- \***risk assessment**- the systematic process of assessing and integrating professional judgment about probable adverse conditions or events; should provide a means of organizing and integrating professional judgments for development of the audit work schedule
- \***risk management**- the process to identify, assess, manage, and control potential events or situations, to provide reasonable assurance regarding the achievement of the organization's objectives

### **Roles in the risk management process**

- management is responsible for assessing potential risks; continuous process (overall responsibility)

-board of directors and audit committee must ensure that proper level of risk management is in place and is effective (oversight)

-internal auditors assist management, board, and audit committee by examining, evaluating, scheduling, testing, and recommending improvements (assistance and assurance)

IAA's role could include: no role, auditing risk management processes, active continuous involvement, managing and coordinating risk

### **Assessing the adequacy of risk management processes**

-reliability and integrity of financial and operational information, effectiveness and efficiency, safeguarding of assets, compliance

-implementation methodology will differ; ensure coordination of objectives

#### **5 key objectives**

1. risks are identified and understood
2. management decides on acceptable risk level
3. risk mitigation activities understood
4. risk periodically assessed continually
5. reports given periodically

-internal auditor continuously assesses and performs functions to address risk issues; wide ranging; professional judgment and experience

-risk management processes can be: formal or informal; quantitative or subjective; divisional or centralized

### **Internal audit's role in the business continuity process**

\***business continuity** – the organization's ability to continue operating during some sort of crisis, disaster, and its ability to restart after operations have been disrupted

-disasters could be natural or man made; not if, but when

-these plans must reflect current situations and should be updated constantly

### **Disaster Recovery Plan**

1. Planning- turnover of management, changes in IT, controls, major projects; regulatory, markets, competition, international financial and economic conditions, technology

2. Evaluation

3. Periodic Assurance Engagements

-after the disaster, IA should: supervise, identify areas, recommend improvements, provide support; immediate response is necessary; review months later for lessons learned

### **Assessing the adequacy of risk management processes for formal consulting services**

-can be helpful if needed

### **2130 Governance**

\***governance**- system by which organizations are directed and controlled; includes rules and procedures for making decisions on corporate affairs to ensure success while maintaining the right balance with the owners' interest

#### **10 basic principles for corporate governance**

1. interaction
2. board purpose
3. board responsibilities
4. independence
5. expertise
6. meetings and information
7. leadership
8. disclosure
9. committees
10. internal audit

#### **4 cornerstones**

1. board of directors
  2. executive management
  3. internal auditors
  4. external auditors
- inappropriate and unethical behaviour is not tolerated

#### **Role of the internal audit activity in the governance process**

- IIA serves as the eyes and ears
- promote ethics, ensure performance, effectively communicate, effectively coordinate

#### **Role of the internal audit activity and internal auditor in the ethical culture of an organization**

- must comply, satisfy, provide, and report
- the organization's culture is largely responsible for the governance process
- shared responsibility for the organization's culture
- IAA as ethics advocates: chief ethics officer, member of internal ethics council, or assessor of the organization's ethical climate
- periodic assessment of the organization's ethical climate

## IV. Understanding internal control and the control processes

-control and the processes that help an organization achieve its goals and objectives; without a reliable control process, the planning process becomes much less valuable and useful to the company than it should be

-tight control processes contributes to improvement in: reliability and integrity of financial and operating information, efficiency and effectiveness of operations, safeguarding of assets, compliance with laws, regulations, and contracts

### 2120 Control

#### Defining Control

**\*control-** a force that leads to something happening or not happening; how management achieves its wishes

**1. preventive-** deter undesirable events from happening; segregation of duties, authorization of transactions, credit checks

**2. detective-** detect and correct undesirable events which occurred; hire certain people

**3. directive-** cause or encourage a desirable event to occur; bank reconciliations, performance reporting with variances

-controls provide assurance on: reliability and integrity financial of statements, effectiveness and efficiency of operations, safeguarding assets, compliance with laws, regulations, and contracts

#### Benefits of strong internal control

-lower external audit costs, better control of assets, reliable information

who benefits: investors, external auditors, legislative and regulatory bodies, customers, employees

#### Assessing and reporting on control processes

-under SOX 302 a report on internal controls is mandatory for all US publicly traded companies

**\*aggregation of many individual assessments-** evaluate internal controls with

-report control discrepancies on a timely matter to mitigate issues; annual report

1. were issues there

2. were they solved

3. does a pervasive condition exist

**\*residual risk**- the risk remaining after management takes action to reduce the impact and likelihood of an adverse event, including control activities in responding to a risk

**\*expectation gap**- management has high expectations, but only allows IAA to do so much

-internal controls provide reasonable assurance, not a guarantee

-is a means to an end, not an end in itself

### **Using control self-assessment for assessing the adequacy of control processes**

**\*control self-assessment CSA**- used to assess strength and adequacy of an internal control process; senior management, operating managers, internal and external auditors

#### **1. facilitated team workshops**

-objective, risk, control, and process based

2. surveys (questionnaires)

3. management-produced analysis

-some combination of the 3

### **Internal audit's role in quarterly financial reporting, disclosures, and management certifications**

-SOX; internal auditor can improve risk assessments and ensure management has better information and surroundings to make the final decisions in

**\*disclosure committee**- establish this; helps with transparency to disclose all relevant information about the financial statements; should include a wide range of employees, including the CAE

### **Establishing the control process**

1. set the objectives

2. measurement against a standard

3. evaluation and correction

-10 general steps;

### **Systems of control**

#### **3 elements**

1. input

2. processing

3. output

-to control the system we need:

4. control

5. feedback

**\*open system**- interacts with its environments, sometimes without want; most systems

**\*closed system**- does not receive any uncontrollable inputs

-Sawyer's 6 elements of a closed control system

### **Feedback element of the control system**

#### **5 components**

1. control object

2. detector

3. reference point
4. comparator
5. activator

### **A. timing of the controls**

--best to catch them before they occur

### **3 types of controls**

1. feedforward- detect the problem before it occurs; preventative maintenance
  2. concurrent- ongoing adjustments;
  3. feedback- identify when something has already gone wrong; statements reviews
- needs to be an ongoing effort,; can be qualitative or quantitative

### **B. controlling and planning**

-related terms

\***controlling**-monitor achievement of those goals

\***planning**- setting forth the goals

### **Characteristics of effective controls**

-economical, meaningful, appropriate, congruent, timely, simple, operational  
 -as with a budget, the control process is more effective when everyone feels like they have a sense of ownership in the process

### **Control and technology**

-computer technology has made controls much better and easier to implement

#### **1. total quality management TQM**

-get it right the first time; emphasizes the quality of the process  
 -organizational action; continuing education and training activities  
 -unique views of customers; the entire organization is customers and suppliers  
 -quality circles; accountability from everyone

#### **2. reengineering**

-business process reengineering; completely new systems  
 -because of effort and time, only done for the most important processes  
 -different from automation (by computers) and rationalization (more efficient)  
 -uses work measurements processes such as micromotion studies

### **The control sequence**

#### **1. setting standards (objectives)**

-find the appropriate cost drivers: quality, quantity, time, cost  
 \***control points**- time or step when the process will be evaluated  
 -statistical sampling, cause and effect processes; get everyone involved  
 -need to be flexible; reviewed or revised on an ongoing basis

#### **2. setting tight standards**

-use discretion with tight standards; can be difficult to meet  
 3. measuring performance against the standards  
 -are there short or long term objectives in place; can be the same  
 -self measurement (more efficient) or second party measurement (more expensive)  
 -performance reports should be limited to controllable actions

#### **4. evaluation and correction**



- compare like items to like items; trait-based or subjective decisions require more time and care
- when used as a motivational tool, needs to focus on something under that person's direct supervision

### **Means of achieving control**

#### **1. organizational methods**

- segregation of duties; simple chain of command; follow up for delegated duties

#### **2. policies**

- stated principle that guides behaviour; are directive controls; mission statement
- establish limits and expectations

#### **3. procedures**

- actions for carrying out the policies; should exist for everyone in the organization

#### **4. pre-numbered forms**

- means of controlling and safeguarding assets

#### **5. personnel**

- supervise, train, and review; keep them informed

#### **6. accounting**

- should fit the needs and culture of the organization

#### **7. budgeting**

- those held accountable for it should be involved in creating it

#### **8. reporting**

- timely and efficient manner; comprehensive for decision making

### **Internal control methods**

COSO- 5 organizations; AICPA, IMA, IIA, AAA, FEI

#### ***Treadway Commission- 1985-1987***

- placed responsibility for the financial statements with who prepares them

#### **1. tone set by top management**

- most important factor

#### **2. internal accounting and audit functions**

- must fulfil the companies specific needs; effectiveness and objectivity

#### **3. members of the audit committee should be independent**

- they have final decisions on everything audit related

#### **4. management and audit committee reports**

- management must take responsibility and give management's opinion

#### **5. seek second opinions from independent public accountants**

- primarily for significant accounting issues

#### **6. quarterly reporting**

- should be overseen by the audit committee
- led to publication of Internal Control- Integrated Framework

### **Internal control- Integrated framework**

- has become the guide for internal control systems today; identified the 5 interrelated components

### **The CoCo model**

-based on COSO, but by the Canadians; 4 components in 20 criteria instead of 5

1. purpose
2. commitment
3. capability
4. monitoring and learning

\***soft controls**- emphasized by COSO and CoCo; not specific tasks, but ideas and expectations; ethics

### **The IIA and internal control**

-1991 Systems Assurance and Controls Study

#### ***Key concepts of internal control***

1. reasonable assurance
2. objectives as desired accomplishments of the organization
3. goals as specific targets

#### ***Key components in internal control system***

##### **1. control environment**

-organization structure, control framework, organization policies and procedures, external influences

##### **2. manual and automated systems**

-systems software, application systems, end-user and department systems

##### **3. control procedures**

-general, application, and compensating

### **COSO model**

-5 interrelated components that comprise internal control; CRIME mnemonic

#### **1. control environment**

-foundation for the other components; management's operating style

-management must believe that the controls are important and communicates that support to employees at all levels

-control conscious- follow procedures at all times without exception

-organizational structure provides the framework for all its activities; delegate authority and responsibility, hold accountable, whatever suits the needs

#### **2. risk assessment**

-anything that dangers the achievement of an objective

-process of identifying, analyzing, and managing risks

\***internal risks**- changes in technology, markets, legislation, legal issues

\***external risks**- embezzlement, falsifying records

#### **3. control activities**

-after risks assessed, design controls to limit the risk and implement control activities

-serve the purpose of protecting the firm's ability to achieve its objectives

**1. preventative**- avoid occurrence of unwanted event; segregation of duties

**2. directive**- ensure occurrence of desirable event; Affirmative Action

**3. detective**- detect occurrence of unwanted event; statement analysis

**4. compensating**- to compensate for control weaknesses; bank reconciliation

**5. corrective**- correct the occurrence of an undesirable event; problem assessment

-examples of control activities: top level reviews, direct functional or activity management, information processing, independent checks, performance indicators, physical controls, documents and records, authorization, segregation of duties  
**\*segregation of duties-** must separate 4 things: authorizing, recording, physical custody, periodic reconciliation

#### **4. information and communication**

-reports must have relevant information in a timely manner

#### **5. monitoring**

-the entire system is monitored by management  
 -can be ongoing or separate evaluations  
 -if done regularly during normal business operations, it reduces the need for separate checks

### **What internal control can and cannot do**

#### **1. can do**

-can help achieve goals and objectives

#### **2. cannot do**

-cannot provide guarantees; only reasonable assurance  
 -must evaluate the cost-benefit relationship

### **Who is responsible for internal control**

1. board oversees everything
  2. CEO sets the tone at the top
  3. senior managers delegate responsibility
  4. financial and accounting officers cut across all levels
  5. internal auditors evaluate effectiveness
  6. external auditors provide input as well
- internal control should be an explicit or implicit part of everyone's job

### **Control techniques**

#### **1. budgets**

-most traditional control tool; puts goals into a quantitative format  
 -for the budget to be used as a control tool, the accounting system and budget must be connected

#### **2. gantt charts**

-divides project into parts; no critical path or interconnection of tasks

#### **3. program evaluation and review technique PERT**

-determines slack time as well as critical path

#### **4. critical path method CPM**

-similar to PERT, but allows for a crashing point

#### **5. control charts (statistical quality control techniques)**

-sampling for statistical control uses; periodic sampling

#### **6. histograms**

-is a visual bar graph

#### **7. pareto diagrams**

-similar to histogram; 20% of causes account for 80% of the problems; highlights issues

**8. cause-and-effect diagrams**

-Ishikawa diagram; fishbone; 4 m's cause the problems: machines, materials, methods, manpower

**9. flowcharting**

**1. systems horizontal**- shows control points for the organizational structure

**2. program vertical**- shows more detail of the processes; not used as much now

**3. data flow**- symbolic illustration of data sources and processes

**10. correlation analysis**

-use test of reason and logic when comparing variables

**11. time series or trend analysis**

4 components: trend, seasonal fluctuations, cyclical fluctuations, irregular variables

**12. special control programs**

-must clearly defined and communicated; educate the employees properly

-zero-defect program has 0 defects as a goal

-management can be imposed control or self control

**People in the control system**

-involve as many as possible; their reaction is important

**Surveillance and monitoring of control systems**

-there must be a control on the control system

-just because it has worked in the past doesn't mean it will continue to

-must consider exogenous variables

**Control implications of organizational structure**

-must be a unity of objective throughout the company

-the relationships between the company must be considered on the basis of: authority, responsibility, and accountability

-tasks can be delegated, but not responsibility

**Elements of the organizational structure****1. complexity**

-the type of differentiation that exists within the firm

\***vertical differentiation**- the more the levels the more complex and slower things travel; tall organizations

\***horizontal differentiation**- the types of skills needed to complete tasks; flat organization – many skills with few hierarchical differentiation

\***spatial differentiation**- geographic separation

**2. formalization**

-high formalization leaves little room for employee decision making

**3. centralization**

-classical theorists like centralization and behaviourists like decentralization

-must be proper information available, able to make decisions, timely manner, coordination, critical to the company

-decentralization works best when the divisions are clearly defined

**A. advantages of decentralization**

-greater speed, better communication, understand company goals, identify and train decision making, more responsibility, frees top management, better financial management

### **B. disadvantages of decentralization**

-focus on short term local issues, increased risk due to loss of control, conflicting decisions, satisficing more (this is good enough so we will do it)

### **4A. delegation**

-key part of the decentralization process; delegation of authority

-determination, assignment, delegation, recruitment, clear, follow-up

### **Structure of the organization**

\***mechanistic**- very set and detailed system; works well for mass production systems

\***organic**- low complexity, high participative decision making; low formalization; adapts to changes better

#### **1. structure and strategy**

-structure is a function of main strategy

-innovation strategy works best with organic design; for cost-minimization, mechanistic works best; imitation strategy is a combination of the 2

-structure is also a function of : organizational size, technology, environment

#### **2. components of an organization**

##### *Mintzberg's 5 organizational components*

-which component dominates, will lead to 1 structure

1. operating core- professional bureaucracy
2. strategic apex- simple structure
3. middle line- divisional structure
4. technostructure- machine bureaucracy
5. support staff- adhocracy

### **Departmentation**

-process of grouping related activities together

#### **1. by function**

-most common; marketing, finance, production departments

#### **2. by territory**

-when divided along geographical lines

#### **3. by product**

-growing in importance

#### **4. by customer**

-better service to customers, but needs large customer bases

#### **5. by project**

-onetime projects normally

### **Matrix organization**

-when any 2 are combined; only issue is that there are multiple bosses to report to now

### **Span of control**

-the upper limit of the number of subordinates that a manager can effectively control

-the size of the organization does not affect span of control

**\*behavioural school**- the more people being supervised, the less time available to really supervise each one

**\*modern approach**- span of control depends on many factors such as job type and skills  
 -span of control affects the number of levels; tall or flat  
 -wide span of control is a flat, and narrow span of control is a tall firm (more room for advancement)

## **Leadership**

-directing process; influencing others so they are willing to work toward the achievement of a process

-authority and decision-making may be delegated, but leadership is an individual trait

### **1. autocratic**

-classical approach; no feedback from employees; can be useful in certain situations (deadlines)

### **2. consultative**

-takes into account employee feedback

### **3. participative**

-must take into account employees decisions

### **4. free-rein**

-employees make their own decisions

### **5. bureaucratic**

-by the book; defers to higher authorities

### **6. transformational**

-supports and implements change; able to inspire

## ***2 behavioural patterns***

### **1. initiator of structure**

-geared toward completion of tasks

### **2. initiator of consideration**

-geared toward developing relationships with co-workers

-leaders must maintain a balance

## ***3 dimensions to contingency approach***

Fiedler's model says chance and many things go into making a good leader

### **1. position power**

-function of formal authority based on person's position

### **2. task structure**

-clarity of responsibilities and tasks

### **3. leader-member relations**

-working well with subordinates

## ***2 types of leaders***

### **1. task-oriented leadership**

-best with very favourable or unfavourable situations

### **2. relationship-oriented leadership**

-best with middle of the road situations

### **Path-goal theory**

-attempts to bring together work on structure, consideration, and expectancy theory  
 -2 factors: environmental and subordinated

#### **4 types of leaders**

1. directive
2. supportive
3. participative
4. achievement oriented

### **Vroom-Yetton-Jago-Model**

-focuses on helping the leader make the best decisions

5 styles: autocratic (1,2), consultative (1,2), group

**\*influence-** an attempt to change the behaviour of someone; consultation, rational persuasion, inspirational appeals, ingratiating tactics, coalition tactics, pressure tactics, upward appeals, exchange tactics

### **Negotiation and conflict management**

**1. distributive bargaining-** zero-sum game

**2. integrative bargaining-** possibility for both sides to win

**3. subordination bargaining-** lower one agrees to anything

**\*third part negotiations-** mediation, arbitration, consultation

**\*interactionist theory-** views conflict as potentially beneficial

-whether or not conflict is helpful depends on how it is resolved: competition, collaboration, avoidance, compromise, accommodation

**\*conflict resolutions-** problem solving, smoothing, forcing, superordinate goals, compromise, expanding resources, changing the human element, diffusion, public media

### **Change management**

**\*organizational change-** process of changing the organizational structure

-resistance and fear of the unknown are the biggest issues

-Nadler and Tushman changes: anticipatory v. reactive and incremental v. strategic

-strategic partnerships and network firms can work well

## V. Engagement planning

-engagement has to do with the planning, performing, communicating, and monitoring of the audit

-also includes supervision, audit procedures, and fraud

### **2200 Engagement planning**

#### *4 main stages*

1. planning
2. performing
3. communicating
4. monitoring

-external audit just does not include monitoring; because the internal auditor is an employee

-consider: objectives, significant risks, control systems, opportunities

-establish: objectives, scope, resources, work program

-needs to: document, state, establish, identify

-CAE needs to establish to whom the results of the engagement will be reported and in what manner; time frame and expected completion date included in the work program

-work program is not shared with everyone; meetings must be documented

-in cases where things were excluded, the CAE must determine if the job can still be done

### **2210 Engagement objectives**

-objectives of the engagement should address the risks, controls, and governance processes

-should be broad statements; risk is the most important

#### **1. risk assessment in engagement planning**

-risks should be considered in the planning process

#### **2. surveys**

-surveys and questionnaires can and should be used

### **2220 Engagement scope**

-should be sufficient to complete the objectives

-should consider: relevant systems, records, personnel, physical properties

-consultation plays a very big role as well

### **2230 Engagement resource allocation**

-determine appropriate resources needed to complete the evaluation

-consider: skills, number of personnel, training, and external resources needed



## **2240 Engagement work program**

**\*work program-** should be written and developed for each engagement the internal auditor performs

- establish objectives and scope; issue survey and then complete the program
- the audit program should include objectives and procedures
- may be adopted from prior audits, and adjustments will be made as needed

### **The preliminary survey**

-on-site survey; first step in the audit process; very important

#### **1. objectives of the preliminary survey**

- allows: become familiar with the client, concentrate the audit work, create a cooperative tone
- any control issues seen from the survey should be immediately communicated orally to management, then written if needed

#### **2. preparation for the preliminary meeting**

- the first meeting with the engagement client; be as prepared as possible
- send out the surveys before the meeting
- ask many questions about the nature of the operations—page 147
- a list of documents, or schedules, that will be required for the audit should be provided with the questionnaire; account listings, charters, job descriptions, flowcharts

#### **3. preliminary meeting**

- identify the tone, explain the engagement, advise that all observations and recommendations will be discussed before formal approval
- collection of documents and walk-through
- discuss high risk issues

#### **4. further meetings**

- costs must be considered

### **Documentation of the preliminary survey**

- should be kept in the permanent file
- document all relevant information in this as well

## **2340 Engagement supervision**

- supervision starts in the planning phase and continues until report is created
- extent and amount of supervision depends on skills on internal auditors and complexity of the engagement
- any additional time or costs must be communicated as soon as possible
- review of the working papers needs to be documented, initial as you go

## **Engagement procedures**

- are written in the program; must ensure sufficiency and competency
- many different types

### **1. Sufficiency of evidence**

- professional judgment, inherent risk and materiality

### **2. Competence of evidence**

- must be both valid and relevant
- most valid is obtained directly by the CAE

- more effective internal controls, more valid is the evidence
- the auditor will require more evidence when obtained from the client than from third parties

### **Sources of evidence**

1. underlying accounting data
2. corroborative evidence

### **Selected engagement procedures**

1. observing
2. questioning
3. analyzing
4. verifying
5. investigating
6. evaluating

\***inductive reasoning**- start specific and get general answers; sampling accounts

\***deductive reasoning**- start general and get specific answers; analytical procedures

### **Tracing and vouching**

\***tracing**- start with a source document and follow it through; completeness

\***vouching**- start with an amount in the ledger and find the supporting documentation for it; existence

-opposites of each other

### **Fraud**

1. fraudulent financial reporting
2. misappropriation of assets
3. corruption

\***scienter**- fucking up but not on purpose

-major risk factor is management override of controls

-audit committee must be involved in fraud involving top management

### **Detection and prevention of fraud**

-more preferable to prevent fraud than detect it

-look for red flags of dumbasses

-management's responsibility

# Conducting the Internal Audit Engagement *CIA Part II*

## **I. Conducting and Monitoring the Engagement**

### **Engagement Information**

1. *Performing the Engagement- Standard 2300*
2. *Identifying the Engagement- Standard 2310*
3. *Analysis and Evaluation Standard 2320*
4. *Engagement Supervision- Standard 2340*
5. *Due Professional Care*
6. *Recording Information- Standard 2330*

### **Communicating the Results**

1. *Criteria for Communicating- Standard 2410*
2. *Quality of Communications- Standard 2420*
3. *Errors and Omissions- Standard 2421*
4. *Client Satisfactory Survey*

### **Engagement Staff Performance Appraisals**

### **Monitoring Progress- Standard 2500**

## **II. Types of Internal Audit Services**

### **Assurance Services**

1. *Financial Audit Engagements*
2. *E-Commerce Engagements*
3. *Due Diligence Engagements*
4. *Compliance Engagements*
5. *Environmental Auditing*

### **Performance Engagements**

1. *Quality Engagements*
2. *Physical Security Audit Engagements*
3. *Audits of 3<sup>rd</sup> Parties*
4. *Contract Auditing*
5. *Privacy Audit Engagements*

### **Consulting Services**

1. *Principles Guiding the Performance of Consulting Activities of Internal Auditors*
2. *Considerations for Formal Consulting Engagements*
3. *Internal Control Testing Consulting Engagements*

*4. Business Process Review/Reengineering Consulting Engagements*

**Fraud Engagements**

- 1. Types of Fraud*
- 2. Responsibilities of the Internal Auditor*
- 3. Conducting Fraud Investigations*
- 4. Responsibility for Fraud Detection*
- 5. Management Fraud*
- 6. Forensic Accounting*

**Control Self-Assessment**

- 1. CSA Approaches*
- 2. Role of the Internal Auditor in a CSA Program*

**Information Technology IT**

- 1. General Controls*
- 2. Application Controls*
- 3. System Security*
- 4. Information Security Engagements*
- 5. Contingency Planning*
- 6. Databases*
- 7. Electronic Data Interchange EDI*

**III. Stats and Data**

**1. Sampling Fundamentals**

*Sampling Risk*

**2. Probability**

*Risk, Uncertainty, and Expected Value*

**3. Data Gathering Tools**

*Interviewing*

**4. Analytical Review Techniques**

*Ratio Analysis*

**5. Variance Analysis**

**6. Other Reasonableness Tests**

**7. The Decision-Making Process**

*Programmed and Nonprogrammed Decisions*

*Decision-Making Styles*

*The Steps of Decision Making*

*Decision Making Errors*

**8. Computerized Audit Tools and Techniques**

*Computer-Assisted Audit Techniques CAAT*

**9. Process Mapping**

# I. Conducting and Monitoring Engagements

## 1. IIA Professional Practices Framework

1. The International Standards for the Professional Practice of Internal Auditing (Standards)- mandatory guidance

2. Practice Advisories- advisory guidance to implement the Standards; not comprehensive, just suggestions

3. Development and practice aids- practical guidance

-PPF is supported by the code of ethics

### 1. Internal auditing standards board- IASB

-develops the Standards; gets input from everyone

### 2. International ethics committee

-maintains the code of ethics and investigates any complaints

### 3. Board of regents

-establishes CIA and CPE requirements

### 4. Professional issues committee

-reviews and releases the Practice Advisories

### 5. Executive committee

-approves administrative directives

## Standards- 4 purposes

1. delineate basic principles

2. establish basis for internal audit performance

3. provide framework for value adding internal audit activities

4. foster firm improvements

## 3 parts

### 1. Attribute Standards

-part I

### 2. Performance Standards

-describe the internal audit activities and the criteria against which to evaluate the performance of these services

1. performing the engagement

2. communicating results

3. monitoring progress

4. resolution of management's acceptance of risks

### 3. Implementation Standards

-apply to the specific type of engagement; A or C

## 2. Engagement Information

### Performing the Engagement Standard 2300

#### *4 responsibilities of the IA*

- 1A. identify
- 2A. analyze
- 2A. evaluate
- 3A. record
- 4A. communicate

### 1A. Identifying information Standard 2310

-first element of performing the engagement

#### 1. sufficient

-enough, professional judgment, source of the evidence, effectiveness of firm's internal controls, always obtain some information directly; materiality and inherent risk of the evidence

#### 2. reliable

- believable as true; corroborative
- third party better than internal, not as good as personally
- get best evidence using appropriate auditing techniques

#### *Degree of persuasiveness and reliability*

-full reliance with just 1 piece of information or partial reliance on several types

#### a. external

- best type, directly from 3<sup>rd</sup> party; receivables confirmations, bank statements
- physical examinations, confirmations or representations by external source, external documentation, reperformance

#### b. external-internal

- generated by 3<sup>rd</sup> party but processed by client; invoices from suppliers
- internal documentation under a strong internal control system, observation, analytical procedures with adequate data

#### c. internal-external

- created by client but processed by 3<sup>rd</sup> party; checks written and sales invoices sent
- internal documentation where strong internal controls are absent, inquiries of management and personnel, analytical procedures when data is not adequate

#### d. internal

- created by and remain with the client; payroll records, receiving reports, time cards
- outsourcing makes it more difficult to classify information

#### 3. relevant

-related to the item in the audit; don't ignore other things though

#### 4. useful

-enables the organization to meet its goals

### 2A. Analysis and evaluation: Standards 2320

- 2<sup>nd</sup> and 3<sup>rd</sup> elements of performing the engagement
- base conclusions and results via appropriate analyses and evaluations

#### *2 classifications of audit tests*

#### 1. Analytical procedures

- performed by looking at expected relationships between 2 items; reasonableness tests
  - may be financial or non-financial, but need some sort of expected relationship
  - examine acceptable level of differences and then investigate any differences
  - the more certain the relationship, the better the evidence from analytical procedures; nature of assertion, and predictability of the relationship
  - if the actual relationship is different than expected, needs to do more testing; doesn't mean it is wrong, just do more testing
  - analytical procedures are based on relationships; determine these prior to testing sources of relationship data
1. financial information
  2. budgets and forecasts
  3. relationships between financial data
  4. industry information
  5. financial and nonfinancial data; employee increase to payroll increase
- double entry accounting does this; they must balance
  - income statement is more reliable than balance sheet; for a period than snapshot
  - more stable the operating environment, more predictable relationships will be and better the evidence from these tests

## **2. Tests of details**

### ***Detailed testing of transactions and balances***

- most common; testing of the accounting documents: invoices, purchase orders

#### **1. tracing**

- start with source document and trace it through the accounting system to the final ledger; completeness

#### **2. vouching**

- start with an amount in the ledger and find the supporting documentation for it; existence
- opposite of tracing

#### ***Others***

4. interviewing
3. recomputing
  - recalculate those done by the client
3. observation and inspection
6. sampling
  - tests a few items within the larger population
7. confirmations
  - \***positive**- reply that it is correct; high assessed risk or large balance
  - \***negative**- reply only if the amount is not correct; low assessed risk or low receivables
  - \***blank**- asks the customer to supply the balance information; large customers
  - if not returned, send another
8. scanning
  - look for unusual amounts in many documents

### ***Nature of information***

#### **1. physical information**

- information obtained from the auditor's direct observation and inspection
- if observation only, use 2 auditors; could relate to anything

**2. testimonial information**

-from 3<sup>rd</sup> parties more reliable; if from client, need more proof; written oral

**3. documentary information**

-written that deals with business transactions; most common; internal or external

**4. analytical information**

-drawn from the relationship between different information and data

-often not the best source

***Legal concepts of evidence***

-legal differs from audit evidence in that it needs oral testimony

**1. primary evidence**

-original document and what is written on it; final piece

**2. secondary evidence**

-copy of the primary; not as good as primary, may have been altered

**3. direct evidence**

-simple comments with no interpretation needed

**4. circumstantial evidence**

-suggests something else happened; not conclusive; guide for other evidence

**5. conclusive evidence**

-gives very strong conclusions; video tape

**6. corroborative**

-support other evidence; what the auditor needs

**7. opinion**

-usually not admitted; except from an expert

**8. hearsay**

-not admitted; what someone did last night

**Engagement supervision**

-a process that begins with planning and continues throughout the examination, evaluation, communicating, and follow-up phases of the engagement

-properly supervised engagement should be more effective in gathering evidence

-ensures working papers are correct; adjustments and alterations are necessary

-skill and experience of auditors and complexity of engagement determine how much supervision needed

-supervisor informs assistants, reviews their work, initializes the working papers; if not correct then correct them

**Due professional care**

-auditor is not infallible however, everyone makes mistakes

-one reason the auditor may not catch everything is that the employer may be hiding things

-fraud is harder to detect; fraud with collusion is even harder

-states that no irregularities were found, not that none existed

-consider; the extent, complexity, adequacy, probability, cost

-any claims of issues must be substantiated with evidence

-if there is not sufficient evidence to support the accusation, must be documented



### **3A. Recording Information Standard 2330- Working Papers**

-4<sup>th</sup> part of the engagement

-working papers are the basis for any conclusion reached during the engagement

-include all the work and tests performed during the engagement

-basis for conclusions, must include everything

#### **Function of working papers**

1. aid in the planning, performance, supervision, and review of engagements; primary function

2. Provide support for the engagement communications

3. documenting engagement completion; when the working paper is complete

4. facilitate 3<sup>rd</sup> party review

5. facilitate quality assurance reviews

6. support for lawsuits, insurance claims and fraud cases

7. aid in training

8. demonstrate compliance with the Standards

-documentation of the work performed, and are useful in the supervision, review, and planning and coordination of the engagement

-also used by outside parties to assess quality work performed; external auditors

-many legal laws also require working papers to be proper

#### **Contents of the working papers**

1. planning

2. examination and evaluation of the internal control system

3. procedures performed, evidence obtained, conclusions reached

4. review process

5. communications from the engagement

6. necessary follow up

-so they must be very complete and contain everything

-could be hard copy, tapes, disks, diskettes, films, computer files

-does not matter, just financial information must reconcile with accounting information

-if disagreements arise about completion, this should be documented in the working papers

#### **Computer, or electronic working papers**

-good for running the tests and

##### ***Security benefits***

1. backing up the data

2. access to the information

3. changing information

##### **Types of working paper files**

1. current file

2. permanent file

-everything is kept in the permanent file; current is just this year\

##### **Preparation techniques**

1. CAE standardizes the process

2. proper headings each page

3. signatures each page
4. index numbers, reference each page
5. verification symbols, tick marks explained
6. sources clearly cited

#### **Complete yet concise manner**

1. only 1 side
  2. clear, not crammed
  3. concise, nothing unneeded
  4. arranged logically
  5. understandable
- staff of the engagement client could be used, but not for the sensitive material

#### **Summaries in working papers**

- summaries should be throughout the papers
1. scope and results; errors, issues, and conclusions
  2. statistical summaries with charts and graphs
  3. immediately summarize meetings
  4. summarize conditions of significant risk exposure; most important, most attention

#### **Needs**

1. index
2. cross-referencing system
3. pro forma statements; extent depends on the audit

#### **Review of the working papers**

- all papers need to be reviewed; receive written documentation
1. all steps completed
  2. all work documented
  3. supported conclusions
  4. relevant guidelines have been followed

#### **Control of the working papers**

- needs policies and procedures for ensuring proper access
- kept with IA's when in the field, and locked up
- may be shown to engagement client if there is nothing sensitive
- for fraud cases, only the group investigating the fraud
- court cases and government requests as well

#### **Retention of the working papers**

- kept for a reasonable time, then destroyed; SOX says 7 years

### **3/4A. Communicating results Standard 2400**

- fourth and final part of the performance of the engagement
1. identify
  2. analyze and evaluate
  3. record
  4. communicate
- the IA should communicate the engagements results **properly**
- communications and monitoring are the output of the IA; interim and final products provide observations, conclusions, and recommendations

-important for evaluation of the IAA, and for external use

### **Criteria for communicating Standard 2410**

1. objectives and scope of the engagement
2. conclusions
3. recommendations
4. action plans

-form depends on item involved, scope, urgency, and people involved; big issue communicated quickly orally

-the communication must meet the expectations of the board and seniors

-informing and persuading are major goals of communication

### **Contents of the final report**

-at a minimum, must include: purpose, scope, results

-must be signed by CAE or similar magnitude

-final communication may also include background and summary

#### **1. Purpose of the engagement**

-outlines the audit objectives; why performed and expected results; cost savings

#### **2. Scope of the engagement**

-outlines activities performed in engagement

1. activities that were reviewed
2. time period reviewed
3. related activities not reviewed
4. nature and extent of work performed

-scope limitations as well; reason for limitation not important

#### **3. Results of the engagement**

1. observations

-just the major ones; if all ok, all ok; comparison of what should and what is

2. conclusions

-evaluations of controls, operating functions, and goals

3. recommendations and action plans

-final report include changes since last audit

### **Criteria for observations and recommendations**

-may also include client accomplishments, related issues, and supportive information

1. criteria

-what should exist

2. condition

-what does exist

3. cause

-why the difference exists

4. effect

-impact of the difference

### **Review and distribution of the report Standard 2440**

-exit interview with the client done before reporting final results

-include auditor, relevant departments, and management

-of agreement all is good; if disagreement, then explain it in the exit interview to management

- document this interview; and auditor perceptions of it
- not a negotiation; confirming everything is factual and what will be communicated
- final engagement communications sent to requisite members
- where senior management is culpable, report goes directly to senior management; CEO usually not recipient, external auditors could be

### **Oral communications**

- used during the engagement, but must be correct
- no permanent records, so be careful
- advantages: timely, immediate feedback, responses, more personal, point things out

### **Progress (interim) communications**

- written or oral before final report
- may include: immediate actions, changes in scope, status of long-term project
- does not eliminate need for final report

### **Quality of communications Standard 2420**

#### ***Reports issued by IA should be:***

1. objective
2. clear
3. concise
4. timely
5. constructive

### **Writing style**

- simple and direct, not draw attention to itself
- active voice (I) not passive (me)
- editors are important: readability, correctness, appropriateness
- proofread before submission

### **Errors and omissions Standard 2421**

- if these exist in the final report, although by accident, must be communicated and highlighted in an amended report to the original recipients

### **Client satisfaction survey**

- client satisfaction survey at the end; questionnaire at then beginning

## **4. Engagement staff performance appraisals**

- performed after each significant audit assignment; provides for immediate feedback while ideas are still fresh

## **5. Monitoring progress Standard 2500**

- last phase of the engagement; without timely monitoring, will not know the outcome of observations or recommendations
- some observations and actions will need immediate action, but for others management may not do it
- so they must perform follow up procedures

### **scheduling follow up work depending on:**

1. risk and exposure involved
  2. degree of difficulty
  3. significance of timing
- must consider a lot of things when doing the follow-ups

-follow ups for consulting engagements will be different

**Management's acceptance of risks Standard 2600**

-as long as the board has been informed it doesn't matter what happens

## II. Types of Engagements

### *2 types of engagements*

#### **1. assurance**

-objective examination of evidence for the purpose of providing independent risk management, control, or governance processes; fraud investigations, financial engagements, quality engagements, operational audit engagements

#### **2. consultation**

-advisory services intended to add value and improve an organization's governance, risk management, and control processes; internal control testing consulting, training, performance measurement systems, business process review; do not involve the IA assuming responsibility

#### **Can be:**

##### **1. financial**

-analysis of economic activity in accordance with specific accounting methods

##### **2. compliance**

-review of financial and operating controls and how they apply to laws, rules, and such

##### **3. operational**

-review of the organization's efficiency and effectiveness of operations

## Assurance Services

-involves objective examination of evidence for the purpose of providing independent assessment of risk management, control, or governance processes

### **3 types**

1. financial
2. compliance
3. operational

-can still be performed by external auditors, but their focus is on the financial statements; external auditors will outsource these functions

### **Performed at 3 levels**

1. organizational
  - department by department
2. functional
  - single process across organizational lines
3. cycle
  - specific systems, such as financial or HR

### **A. Financial Audit Engagements**

-to test the reliability and integrity of reported financial information and to ascertain that the company's assets are properly safeguarded

-usually external but can be done internally as well; areas not as well covered or just for efficiency

### **performed according to transaction cycles:**

1. payroll and personnel
2. payment and financial capital
3. cash collections (receivables) and revenue
4. purchasing and payables
5. inventory and warehousing

-can be combined and vary from firm to firm

### **1. Documents and individual in the transaction cycles**

#### **A. Sales, receivables, and cash receipts cycle**

1. sales order
2. shipping documents
3. sales invoice
4. remittance advice
5. bills of lading
6. list of remittances
7. deposit slips
8. check listing
9. credit memo
10. receiving report

#### **Individuals**

1. opening the mail

2. making the deposit
3. treasurer
4. controller

***B. Personnel and payroll cycle***

1. payroll master file
2. time clock
3. time card
4. job time tickets

**Individuals**

1. paymaster
2. internal auditor
3. treasurer
4. department foreman (foreman)
5. imprest payroll accountant

***C. Inventory and production cycle***

1. requisitions
2. shipping or transfer reports

***D. Property, plant, and equipment cycle***

1. purchase authorizations
2. purchase order
3. receiving report
4. vendor invoice

**2. Audit risk and assertion models**

-used to develop an approach to financial audits; can still be used for non-financial

**1. audit risk**

-risk the auditor will give an unqualified opinion when there is an issue

***3 events must have occurred***

**1. Inherent risk**

-error made to begin with

**2. Control risk**

-internal controls failed to detect the error

**3. Detection risk**

-auditor fails to detect the error

-auditor assesses control and inherent risk, but can't influence them

-detection risk is the only the auditor can influence; once inherent and control have been assessed, the tests of controls are designed appropriately (more or less needed)

-can be measured quantitatively or qualitatively

-all are connected, when 1 rises, another will fall

**2. assessing control risk**

-easiest one to control for; will be assessed at maximum level to start; if it isn't (assessed below maximum level) , must document why it wasn't, should be lowered if controls are effective

**3. relationship between control and detection**

-lower the control risk the higher the detection risk can be ; inversely related

-2 ways to detect an issue; through the auditor or controls, so 1 must work



-external auditors must make their own independent risk assessments

#### **4. relationship between detection and audit tests performed**

-inverse relationship between detection risk and amount of work to be performed  
 -detection risk high and control risk low, not many tests performed because tests are already good and do few tests to not get any mistakes (high detection risk)

#### **5. financial statement assertions**

-different assertion is more important for different items  
 -these are what management says is correct; what we must uncover defects in  
 -still test them all to some degree; just some more

1. completeness
2. rights and obligations
3. valuation or allocation
4. existence or occurrence
5. statement of presentation and disclosure

#### **3. Internal Auditor's role in the financial reporting process**

-IAA can play a role in support of good corporate governance, but is management's responsibility  
 -IA must assure management the controls are working properly and that no errors exist

#### ***3 areas IA can help in the financial reporting process***

1. financial reporting
2. corporate governance
3. corporate control

### **B. E-Commerce Engagements**

-conducting commercial activities over the Internet  
 -B2B, B2C, B2E

#### **1. understanding and planning e-commerce engagement**

-is becoming more and more important and extensive  
 -different skills will be needed for this

#### **2. e-commerce risks and control issues**

-goals and objectives are the same, but the structure of information being audited is different

-no paper trail, no hard copy, short time available

-reviews must be done often to keep pace with changing technology

#### **3. auditing e-commerce activities**

-main purpose: ensuring that all e-commerce processes have effective controls

-will vary depending on country and legal and industry

#### **Protocols to follow:**

##### **1. e-commerce organization**

-determine the scope and basics

##### **2. fraud**

-be alert for funny situations

##### **3. authentication**

-policies for authenticating transactions and evaluating controls

**4. corruption of data**

-evaluate controls over data integrity

**5. business interruptions**

-business continuity plan and alternatives

**6. management issues**

-how well businesses are managing the e-commerce process

**C. Due Diligence Engagements**

-usually performed in connection with a potential acquisition, joint venture, or divestiture

-to validate reasons for or look for issues

-look at the company's books prior to offering bid (due diligence)

-environmental due diligence audits as well; may need extra special outside assistance

-due diligence is also protection against lawsuits and such due to mistakes; providing due diligence is enough to prevent litigation

**D. Compliance Engagements**

-determine a firm is in compliance with laws, regulations, or anything, environmental

**E. Environmental Auditing**

-hazardous waste is a big issue for internal accountants

**7 types****1. compliance**

-most frequent; deals with laws and regulations

**2. environmental management systems**

-to discuss impacts from pending legislation

**3. transactional**

-on new property for issues or feasibility

**4. treatment, storage, disposal facility**

-follows hazardous materials from the cradle to the grave

**5. pollution prevention**

-eliminating or minimizing pollution at its source

**6. environmental liability accrual**

-when environmental liabilities need to be accrued

**7. product audit**

-production process to see about pollution

**F. Internal Audit's Role in Identifying and Reporting Environmental Risks**

-Environment, Health, and Safety EHS

-will be done separately in big companies

**1. Suggestions for the CAE**

-CAE should still be involved in reviewing the audit plan, even if the environmental guy reports to someone else

-can be compliance or management systems focused

## Performance Engagements

### 1. economy and efficiency engagements

will determine: on a certain program or activity

1) whether an operation is using its resources economically and efficiently

-must know the goals and objectives

2) the reasons for the operations' inefficiencies

-talk to the people

3) compliance with laws and regulations pertaining to issues of economy and efficiency

-be aware of any laws and regulations

### 2. program-result engagement

-focuses primarily on output, effectiveness; achievement and compliance

### 3. performance (operational) engagements

-several types

#### Internal Auditor's Role after a disaster

-immediately after do many things

-after several months do reviews

-management will decide how involved the IA will be

### A. Performance Operational Engagements

-tests the functions within an organization

#### 1. Business continuity planning engagements

-not if but when; natural or man made

-must assess periodically

*IA can assist in:*

1. planning

2. evaluation

#### 3. periodic assurance engagements

-periodically assess business continuity and disaster recovery plans; can become outdated very quickly

#### 2. Quality Engagements

-right first time; 0 tolerance of wastage; everyone has a role to play

-a quality audit engagement will ensure that all quality standards are being met

#### A. Benchmarking

-primary tool in the implementation of TQM

-can help with productivity management and business process review; source of consulting service for IA

-best practices for competitive advantage

-company does not have to be in the same industry

-can be internal or external

\***functional benchmarking**- within the same technology area

\***competitive benchmarking**- against the best competitors

\***generic benchmarking**- comparison of process, such as invoices

## **B. ISO 9000**

-to gain international ISO 9000, must be verified by external auditor

-provides quality assurance in:

1. 9000- describes fundamental quality concepts
2. 9001- design, development, production, installation
3. 9002- prevention, detection, and correction
4. 9003- final inspection and testing
5. 9004- develop and implement an internal quality system

-target for the entire production line, not a single product

-environmental standards are ISO 14000

### **ISO audit engagements**

-will determine conformity with requisite laws and such

-needs to be familiar with the quality issues that that firm has

### **3. Physical Security Audit Engagements**

-ensures that an organization's physical facilities are properly secured and that the environment is safe for management and staff

\***perimeter security**- requires a review of the property boundaries and a boundary risk assessment, including documenting risks on a site map

\***proximity security**- involves determining whether the buildings are subject to risks; vehicles checked; and people checked

\***physical security**- whether building entry points are properly secured

-guard for escorts if needed, fire and bomb threat procedures, surveillance equipment in the physical inventory area;

### **4. Audits of Third Parties**

-necessary when there is a lot of work done by the 3<sup>rd</sup> party; must have the consent of the 3<sup>rd</sup> party though; SOX made this more important

-can use either an internal or external auditor

### **5. Contract Auditing**

-includes construction-type contracts and operating contracts

\***lump-sum contracts**- give the total price in accordance with specifications or requirements; issues include: progress payments, escalation clauses, delay penalties, and adjustments for costs

\***cost-plus contracts**- whereby the buyer will pay the cost plus a fixed or % of cost to the contractor; used with projects with significant unknowns; no incentive for efficiency or economy

\***unit-price contracts**- where the cost-per unit is set but the total units will be quantified as the contract is being executed, such as area to be patrolled or cleared

### **Auditors must examine**

1. bidding procedures
2. cost estimates and cost controls
3. tax treatments
4. terms of the contract and progress payment plans
5. budgets and financial forecasting, availability of resources and sources of funding
6. contractor's accounting and management systems
7. required performance bond

### **6. Privacy Audit Engagements**

-even though there is no guaranteed security, the firm must ensure all reasonable measures have been taken; to ensure information is properly safeguarded

***3 things***

1. evaluate the privacy framework
2. identify significant risks
3. evaluate controls

## Consulting Services

-management studies or consultancy projects

### **1. Principles Guiding the Performance of Consulting Activities of Internal Auditors**

1. value proposition
2. consistency with internal audit definition
3. audit activities beyond assurance and consulting
4. interrelationship between assurance and consulting
5. empower consulting through the internal audit charter
6. objectivity
7. internal audit foundation for consulting services
8. communication of fundamental information
9. principles of consulting understood by the organization
10. formal consulting engagements
11. CAE responsibilities
12. criteria for resolving conflicts or evolving issues

### **2. Considerations for Formal Consulting Engagements**

-sometimes consulting and assurance activities may be blended; but sometimes they must be separated

#### *Types*

1. formal- planned and subject to written agreement
2. informal- committees and meetings
3. special- mergers or such
4. emergency- after disasters

-do not take a consulting to circumvent assurance

#### *Considerations*

#### **1. independence and objectivity in consulting engagements**

-even if did assurance work as well

#### **2. due professional care in consulting engagements**

-consider needs, complexity, and cost/benefit analysis

#### **3. scope of the work in consulting engagements**

-sufficient to meet objectives

#### **4. communicating the results of consulting engagements**

-no specific standards; describe everything

#### **5. documentation requirements for consulting engagements**

-policies must be in place governing

#### **6. monitoring of consulting engagements**

-different follow-ups will be necessary

### **3. Internal Control Testing Consulting Engagements**

-SOX requires an assessment of effectiveness of internal controls

-independent auditor cannot be a part of this; can consult however

**4. Business Process Review/Reengineering Consulting Engagements**

-either improves processes or completely reengineers them

-characteristics include: IT, empowering employees, cross-functional teams, and boundary spanning coordination

-involves rethinking all aspects of a process, including outputs, structure, tasks, and technology

## Fraud Engagements

- primary means of detecting and deterring fraud
- committed when individuals intentionally
  1. misappropriation (theft) of company assets
  2. misstatement of the financial statements
  3. omission of the truth
- if committed without intention, it is not fraud

### 1. Types of Fraud

- persons outside or inside can perpetrate fraud
  1. benefit the organization
  2. detrimental to the organization

#### Responsibilities of the Internal Auditor

- examine controls to see if fraud can happen and catch the people doing it
- preferable to prevent fraud than detect it after it happens
- report to the highest level from which it happened
- auditor is interested in how it occurred what needs to be done to fix the controls
- types of fraud are numerous, but many factors can determine if it occurred

### 2. Conducting Fraud Investigations

- determine the effects of and report to senior management
- not usually report to those outside the organization
- outside personnel could investigate to, but audit doesn't have to report to them
- report immediately any instance of significant fraud to management; make sure it really occurred
- must conduct the investigation appropriately and then determine what- needs to be done for corrections
- must have sufficient knowledge of fraud, be alert to control weaknesses, evaluate indicators that fraud happened, notify appropriate authorities

#### Responsibility for Fraud Investigations

- management must establish and maintain an effective control system that is cost effective; IA must exercise due professional care for fraud detection

#### Fraud Indicators

- fraud indicators and risk factors of fraud to be looked for; red flags
- red flags are subjective in nature

### 3. Management Fraud

- needs to meet goals, industry conditions, regulatory environment, nature of business affect risk of fraud by management
- management override of controls is the biggest risk factor
- types of controls and types of assets will determine the risk of fraud; management nuts also be adequately trained about the risk of fraud factors



**Potential Red Flags**

-there are many

**Engagement Procedures**

-fraud existence affects the nature and scope of the engagement

-analytical procedures can be performed to detect fraud

**Forensic Accounting**

-applies to areas with potential legal implications or consequences;

-the forensic expert helps the IA gather evidence prove or negate suspicions

**4. Legal Hazards**

-must be conducted appropriately and within legal standards

-must be aware of common and statutory rights

**Issues**

1. defamation of character; slander is oral and libel is published

2. false imprisonment

3. malicious prosecution

4. compounding a felony

-employee already did something, this makes it worse

-confessions can be good, but not if made under duress (tainted)

**Considerations**

1. consult with legal counsel first

2. interrogations are best with 2 to 3 people as witnesses

3. be certain of facts

## Control Self-Assessment

-the examination and assessment process of the effectiveness of the control system within the company performed by the company's personnel, with the help of facilitators from the internal audit department

-control is the responsibility of every employee (employee become **process owners**)

-control risk self-assessment CRSS

-self-assessment by the people is a big part

-CSA assumes the opposite of IA, employees have the greatest self awareness so they are the best at recognizing problems

-assessments can be performed in many ways and apply to any part of the business

-goal is to help firm's ensure likelihood of meeting objectives via the knowledge of the workers who actually do the work

### ***Includes***

1. identifying potential risks and exposures
2. assessing the control processes that mitigate those risks
3. developing actions plans to reduce risks to acceptable level
4. determining the likelihood of achieving the business objectives

-includes many primary advantages

-must be customized to fit the characteristics of that organization

### **CSA Approaches**

#### **1. Facilitated Team Workshops**

-involves ground from different levels; specialized facilitator has no motives

#### ***4 Primary Formats***

1. objective-based risk format
2. risk-based format
3. control-based format
4. process-based format

-hard-work and preparation is required by the facilitation team

#### ***5 Critical Components***

1. facilitators interview participants before the workshop begins
2. time for the team to brainstorm, develop ideas, and discuss ideas
3. control issues
4. quickly provide a summary of the discussion to the participants
5. action

-also discuss areas for new audits and improvements for new audits

#### **2. Surveys (Questionnaires)**

-ask simple questions; may be customized or specific to needs; relate primarily to internal controls and how controls are monitored

#### **Weaknesses**

1. all questions can't have yes answers
2. the auditor cannot review the results, the process manager must
3. if the questionnaires do not work, see out interviews with those people

**3. Management-produced analysis, or self-auditing/self-certification**

-management reviews their own surveys; or info from several different managers is used to complete a document for management to use as suggestions

-it not unusual for organizations to combine more than 1 of the above mentioned practices; most programs will share features anyhow

**Role of the Internal Auditor in a CSA Program**

-audit's role in a CSA program can vary widely

2 extremes

1. maximum, do everything

2. minimal, serve as consultant and verifier

-usually falls between the 2 continuums

-facilitator must be good interpersonal skills and good with analytical processes

## Information Technology

- computers increase the possibility of exposure to inaccuracies and fraud
- no human error in processing transactions; but clerical input errors will be outputs errors
- IT computing processes can increase the quickness of fraud, as well as the amount of fraud that can happen in a short time
- lack of paper trail and documents deleted quickly, IT reliability for audits is low
- computers also provide positive benefits for things such as quick access and better controls, and also have the same objectives as similar intern auditing functions
- can employ an event system to see if all processes at the same point in time are functioning correctly
- the computer is where to go when no other information is possible
- all the new advances in IT are also causing needs for continuous risk assessments

### ***2 Types of IT Audits***

1. data integrity
2. security

### ***2 Types of Controls***

#### **1. general controls**

- relate to the environment

#### **2. application controls**

- relate to individual applications

### **1. General Controls**

- ensure company's control environment is stable and well managed
- includes controls over: development, modification, and maintenance of computer programs

### **4 Categories**

1. organization and operation of the computer facilities
2. general operating procedures
3. equipment and hardware controls
4. access controls to equipment and data

### **Organization and Operation of the Computer Facilities**

#### **1. separate responsibilities within the information technology department**

- most important operational and organizational control is segregation of duties; IT segregation may differ from traditional, but still is important

### ***Positions and responsibilities within the IT department***

#### **1. database administrator**

- develops and maintains the database and establishes proper controls over the database; makes access to only those who need it

#### **2. systems analyst**

- reviews the systems; no access to programming, hardware, software, data files

#### **3. programmers**

- systems programmers should not do applications programming

**4. computer (console) operators**

-computers operators and programmers must have segregation of duties

**5. data conversion operators**

-convert and transmit data

**6. data conversion operators**

-convert and transmit data

**7. librarians**

-maintain documentation, program files, and data; no access to equipment; their stuff should be checked by others as well

**8. data control group**

-does the inputting and, logs, monitors, distributes overall reviewer; must be organizationally dependent of computer operations

**9. transaction authorization**

-perform the authorizations for all things with signatures

**10. end users**

-need to have access only to the final output that is produced

**2. separate IT operations from other departments**

-IT must be completely separate from the organizations they support; most important

1. users, not IT, must initiate and authorize all systems changes
2. asset custody remains with the user departments
3. error log maintained and referred to the user for correction

**General Operating Procedures**

-same procedures for all audits

-auditors need to determine whether the control group is accountable for data from the time it is received until it is distributed as output to users; auditors need to review job rotation schedules as well as vacation records

**Equipment Controls**

-backup procedures, transaction trails, statistics kept and reviewed

**Equipment Access and Data Access Controls**

-responsibility for logical and physical security should be assigned to an information security manager who reports to the firm's senior management

**1. logical security**

-consists of access and ability to use the equipment and data

-used to identify authorized users and the actions they can perform; log into accounts and IDs and passwords; closed when no longer needed

-includes firewalls, virus protection, and encryption; dial up connections should be prevented

-t proper people have access; data trails, levels of access, unauthorized use reported

**2. physical security**

-includes both physical access control and security of equipment of equipment and premises

\***physical access control**- takes place within the data centre and outside it

-access to certain records confined to certain terminals

-access limited to authorized persons though zones

-visitor's log, dual access procedures, biometric procedures

\***physical security**- involves the physical security of the equipment and the premises

- fire alarms systems, alternate power sources, surge protectors, archive and back up media contents, servers and associated peripherals, kept in secured areas
- heat and cooling issues must be needed for sensitive electronic equipment
- labels, and possible offsite backups
- obviously report weaknesses on timely and efficient matter

## **2. Application Controls**

- controls specific to individual applications
- designed to prevent, detect, and correct errors in transactions as they flow through input, processing and output

### **1. Input controls**

- input errors are the most common type; review anything to determine
- provide reasonable assurance that the data entered into the system has proper authorization, has been converted into machine-sensible form, and has been identified
- assurance that data has not been lost, suppressed, added, or changed
- batch-processing systems are easier to monitor than real-time systems

### **1. edit checks**

- these check to ensure everything logically is right
- error listing, field checks, financial totals, hash total, limit and range checks, preformatting, reasonableness (compatibility) test, record count, self-checking digits, sequence checks, sign checks, validity checks, overflow test, check digits, reconciliations, and balancing, error correction

### **2. key verification**

- input the same information twice to ensure accuracy

### **3. redundancy check**

- send additional sets of data to confirm the original

### **4. echo check**

- send data back to computer to ensure what comes back is the same

### **5. completeness checks**

- determines whether all necessary data was sent

### **6. automatic computed transactions**

- orders or upgrades

## **2. Processing controls**

- provide reasonable assurance that processing has been reasonably completed, with programming errors in a timely manner
- also include physical security of the equipment and access to the equipment
- must ensure the application is processing input data in an accurate and timely manner, as intended by management, and with no unauthorized data modifications

### **1. posting check**

- compares the contents of the record before and after updating

### **2. cross-footing**

- compares the sum of the individual components to the total figure

### **3. zero-balance check**

- used when a total sum should be 0

### **4. run-to-run control totals**

- critical information is checked to ensure it is correct to that point

**5. internal header and trailer labels**

-ensure proper labels

**6. concurrency controls**

-process of managing the situation when 2 or more programs are trying to access the same information at the same time

**7. key integrity checks**

-makes sure keys don't change during processing

**3. Output controls**

-provide reasonable assurance that the processing result is accurate and that only authorized personnel receive the output

-make sure output information is sent to the right people, is accurate and sent in a timely manner and the proper reports are retained for the appropriate period

**\*data control group**- supervises the output of the system

**1. forms control**

-physical control over company checks

**2. report distribution**

-authorized report distribution lists are necessary

-confidential reports should be shredded when they are no longer needed

**3. handing of exceptions**

-when transactions are rejected; when transactions are correct, could be due to equipment malfunction or operator error; error logs used and distributed

**Organizing the Information System Systems Function**

-used to centralized processing where 1 mainframe communicated with dumb terminals that had no ability to process

-now the model is moving towards centralized control with decentralized components

**\*totally centralized system**- all data processing done at 1 location, in 1 processing centre

-remote terminals cannot process data, only input; economies of scale

**\*totally decentralized system**- each remote location has its own processing staff; so more closely resembles individual needs, but is more costly

**\*fault tolerant**- have backup processors , peripherals, and software to continue to operate even when a major component fails

**\*fail-safe capability**- operating at full capacity when a failure occurs

**\*fail-soft capability**- operating at a reduced capacity when a failure occurs

-most IT systems are hybrids; some have spun off to provide business for other companies

-outsourcing is majorly used now, as is application service providers ASPs, which outsource via the internet

**Processing Modes****1. batch mode**

-collecting large amounts and processing at same time; payrolls

**2. remote batch processing**

-doing batches from 2 locations

**3. online, real-time processing**

-transactions are processed as they are entered; master files are continuously updated

-many inherent and control risks need to be considered with these systems

-stronger controls are needed here though; does not permit sequential processing

#### **4. online entry with memo posting and batch processing**

-bank accounts; transactions entered throughout the day online, batch processed at the end, and then reconciled

#### **5. timesharing system**

-many entities have access; their transactions are processed in turn, allowing for

#### **6. service bureaus**

-similar to time sharing; contract someone to do payrolls

### **Computer Programs and Software**

-programming language translators, or compilers, are programs that translate programming language into machine language that computers can execute

#### **1. systems software**

-programs that support the computer system; enables the computer to execute the application programs by performing the necessary language translation; monitoring the data communications; and controlling the input and output, file management, file access and data storing

\***operating system**- first program that is downloaded to the computer's hardware; acts as the interface between the computer hardware, software applications and the users; DOS, Windows, Unix, Linux/Red Hat, OS/2 by IBM

### **5 functions of OS**

#### **1. user interface**

-allows communication to load programs and access files; command drive, menu drive, graphical user interface GUI

#### **2. resource management**

-memory management systems; keep track of where things are stored

#### **3. file management programs**

-control creation, deletion, and access of files; keeps track of physical locations of files on secondary storage devices

#### **4. task management programs**

-enables multitasking: keyboarding and printing; memory and processing ability determine how much it can handle

#### **5. utilities and support services**

-housekeeping functions: data backup, data recovery, virus protection, data compression, defragmentation

-other types of systems packages include compilers, which convert program source code into machine executable programs and database management systems

-controls are very important because of the intricacy of these systems

-upgrades to the operating system will require modifications to the operating system

-because 1 type of computer thing can affect many others, only the necessary people should be accessing them

#### **2. systems development**

-the systems development life cycle approach is necessary to implement computer changes; based on the premise that systems always need change and new life cycles

-general characteristics include: development by a project team, and an information systems steering committee that works with the project team

### ***Project Definition Stage***



**1. statement of objectives**

-what is needed

**2. systems investigation and feasibility study**

i. technical feasibility

ii. economic feasibility

-includes cost benefit analysis

-tangible costs and benefits and intangible costs and benefits

iii. operational feasibility

***Project Initiation Stage*****1. systems analysis**

-organizational analysis, functional requirements, system requirements, system requirements, alternatives, systems analysis report,

**2. systems design and development**

-designs and evaluations, documentation, flowcharting, program coding (computer-aided software engineering CASE, object-oriented programming, visual programming)

**3. systems implementation**

-involves acquisition of resources for the new system and its initial operations; controls implemented

***System conversion options*****1. parallel**

-both run together for a period of time

**2. phased**

-parts are phased out here and there

**3. pilot**

-tested in 1 department first

**4. plunge**

-all in

-training and troubleshooting are very important as well

**4. systems evaluation and maintenance**

-post-implementation review of everything

**Prototyping as an Alternative Method of Systems Development**

-make changes as the program is being installed; ad hoc iterative measure

-used for Decision support systems DSS, Expert systems ES, and Management Information Systems MIS

-involves initial estimations and then keeps going

-useful when: needs are unknown, try as you go to avoid costs, short period of time

-bad things: may be accepted too early, difficult to control, may never get finished, can be expensive

**Program Development and Documentation Controls**

-documentation of a program should be kept secure, used by everyone, and explains the programs

-documentation is an internal control activity

***Types of documentation***

1. system

2. program

3. operating
4. procedural
5. user

### **System and Program Change Controls**

- steering committee approves or recommends projects and then reviews their progress
- change controls must be strictly monitored; changes made to a copy; librarian moves the copy to the processing environment;
- audit trail of all changes must be documented; this allows future issues with the change to be corrected rather quickly
- test changes with correct and incorrect on information to detect nay issues
- test data should test for program's edit capabilities; edit function includes sequence checks, valid field tests, reasonableness checks; unauthorized changes can be compared to the master copy
- programs are written in source code; object code is language the machine processor understands; source code is converted to object code via a compiler, and the object code is what runs the program
- in theory the source and object code should correspond, the computer doesn't require them to
- main thing the auditor needs to do is ensure that program changes have been properly authorized, tested, and implemented

### **End-User Computing**

- end-users are responsible for everything, not a specialized system

#### ***Advantages***

1. unprecedented systems-development backlog
2. more demanding and better-educated users
3. timely information as a corporate environment
4. acceptance of the computer environment
5. increasing sophistication of business analysts

#### ***Disadvantages***

1. audit and control concerns
2. risk of organizational inefficiencies

### **Application software**

- the programs we all use everyday
- most programs come in object code, because that is harder to change, so support issues become easier to resolve

#### **1. general-purpose application software**

- productivity packages; word, spreadsheet, email; software suites include everything

#### **2. application specific software**

- for any specific purpose

- i. generalized audit software package GASP
- ii. decision support software

- used for what if analysis, sensitivity analysis, goal-seeking analysis, optimization analysis

1. structured decisions/ operational management level
2. semi-structured decisions/tactical management level

### 3. unstructured decisions/strategic level

#### **Software Privacy**

- unauthorized use and copying of software; software is intellectual property that can be bought with a license; so cannot be legally transferred between users
- some require activation to prevent this with serial numbers
- \***shareware**- free software on the internet
- so software licensing agreements allow only a specified number of users

### **3. System Security**

- accessibility creates vulnerability
- electronic eavesdropping, user account management, firewall, anti-virus

#### **Viruses, Trojan Horses, and Worms**

\***computer virus**- a program that alters the way another operates; can damage programs, delete files, or reformat the hard disk; some just replicate and present messages, they may not damage, but can interfere by taking up memory space

#### **2 virus criteria**

##### **1. must execute itself**

- places its own code in the place of another

##### **2. must replicate itself**

- can replace other executable files with the virus

\***Trojan horse**- does not replicate itself; confines to 1 target; makes something do something it is not supposed to do; can be used to steal information or damage files

- can get it by opening an e-mail attachment or downloading something from the internet

\***worm**- does not require an infected host file to replicate itself, while a virus does; generally exist inside other files, like word or excel files, then the worm document releases the worm macro

- antivirus software is the best, but must be continuously updated

#### **Cybercrime**

- crimes where the computer is the major factor in committing the crime
- FBI National Computer Crime Squad NCCS; Federal Computer Fraud and Abuse Act CFAA; Association of Information Technology Professionals

#### **Types**

##### **1. copyright infringement**

- music and such

##### **2. denial of service DOS**

- crash the website so others can't use it

##### **3. theft of credit card numbers**

- from retailers' files

##### **4. phishing**

- uses e-mail to get free info from people

##### **5. spoofing**

- direct people to websites to provide critical information

\***port scans**- locate weaknesses in website software programs

- then use a Trojan Horse to infiltrate and leave a back door for reentry

\***sniffers**- snatch passwords

- can be positive or negative; positive is to compare for discrepancies

- anything transmitted over a network is vulnerable to a sniffer; LAN's must be switched in order to prevent a sniffer from catching valuable information
- legitimate use is monitoring employee website activity

### ***Other tools of hackers***

#### **1. password crackers**

- creates different combinations of letters and numbers to crack passwords

#### **2. war dialing**

- dial random numbers in search of a connection

#### **3. logic bombs**

- computer has a default and a virus exploits it

#### **4. buffer overflow**

- sending too much info to buffer, disabling it or allowing hacker access
- social engineering (tricking information from someone) and dumpster diving are also used

- Google has pay per click ads on their website; continuous click of these

- website publishes a Google ad, then clicks it self to inflate revenue

- leaving employees use their company e-mail to transmit info to new company

- can mask IP addresses

### **Defences Against Cybercrime**

#### **1. firewall**

- best protection against portscans; serves as a barrier between the internal and the external networks and prevents unauthorized access to the internal network; can also prevent back door applications like Trojan Horses; usually prepare reports about usage; can be software or hardware

#### **2. proxy server**

- computer and software that creates a gateway to and from the internet; contains approved sites IP addresses; employers can use to limit employee access
- can also limit incoming information, serving as a firewall; also can contain a limited amount of information so that the company can only lose so much

#### **3. antisniffers**

- defend against sniffers; when sniffers are running, the computer NIC gets in a promiscuous mode; these detect if any computers are in NIC mode

#### **4. switched network**

- eliminates the broadcasting of traffic to every machine

#### **5. encryption**

- best defence against traffic interception resulting in data leaks and possible corruption of data; converts data into code and a key is required to convert it back; can be hardware or software; 2 methods software encryption

**\*public/private key system-** 1 key for each

**\*secret-key system-** better for companies; firm holds the main key and employees have the others; always needs a digital signature; SSL and S-HTTP

#### **6. domain keys**

- match e-mails; developed by Yahoo

- best defences is to not be stupid

### **4. Information Security Engagements**

- systematic assessment of how the organization's security policy is employed as a specific site
- has become a crucial expansion of assurance services provided by both internal and external auditors
- otherwise, proceed similarly as with all other audit engagements
- can use a penetration test where a specialist comes in and specifically pinpoints areas in the IT system

## **5. Contingency Planning**

- all companies must have plans for the backup of data and recovery of data

### ***Back up and recovery processes***

1. back up program and data files
2. transaction log so can roll back to last entry
3. electronic vaulting; store back ups in secure sight
4. uninterruptible power supply UPS
5. grandparent-parent-child processing
5. Fault-tolerant systems

- utilize redundancy, if one fails, another kicks in

### ***Redundancy issues***

1. consensus based protocols
2. watchdog processor
3. disk mirroring, disk shadowing
4. rollback processing
5. duplicate circuitry
6. redundancy check, summary processing
7. echo check
8. dual read check
9. boundary protection
10. graceful degradation
11. overflow check

## **Disaster Recovery**

### ***Plan specifies***

1. who participates in recovery
2. what hardware, software, and facilities will be used
3. priority of applications to be processed

- hot site, cold site, mobile recovery centres

- everyone should be trained, and a copy of orders should be at everyone's home

### ***2 issues***

1. could the company survive
  2. what are the odds and extent of the disaster
- many different things to consider for this issue

## **Data Communications and Telecommunications Networks**

- a telecommunications network is a means of communications: sender transmits message to a receiver over a channel consisting of mediums

### ***Telecommunications network components***

#### **1. terminals**

-may be networked PCs, network computers, or dumb terminals, where keyboards/monitors with no processing ability

## **2. telecommunications processors**

-modems, switches, routers, perform support and processing functions; they code and decode data and control the flow of communications between computers and terminals in the network

## **3. telecommunications channels**

-the media over which data are transmitted and received; may be copper wires, coaxial cables, fiber-optic, or wireless

## **4. computers**

-networks can connect all sizes and kinds of computers

## **5. telecommunications control software**

-programs that control telecommunications activities; network operating systems for network servers, web browsers for microcomputers, and telecommunications monitors for mainframe host computers

## **Types of Networks**

-a network is a system that connects computers together; allows users to share resources (software, hardware) among various users; 7 types

### **7 Types**

#### **1. private networks**

-dedicated facilities that do not require a connection; PBX telephone system

#### **2. public-switched network**

-uses standard public telephone lines; cheapest but slowest

#### **3. value-added network**

-lease public telephone lines, then add other services such as mailboxes, error correction and packet switching that enhance the speed; packet switching breaks it down and reassembles at other end; frame system is similar to packet switching but doesn't have error correction

#### **4. LAN**

-set up within an office

\***peer-to-peer**- all connected to each other

\***client/server**- uses some servers

\***gateway**- way to connect to networks or devices that would otherwise be incompatible

\***Ethernet**- most common way of connecting a LAN; allows different computers to talk to each other

#### **5. WAN**

-more global than a LAN

#### **6. internet**

3 parts: server that holds the information; client who is viewing the information; and the protocol that enables them to communicate with each other

#### **7. virtual private network VPN**

-uses the internet to network between offices; greatest threat is security, needs firewalls

## **Bandwidth**

-classify communications speed and capacity of telecommunications networks

-determines the maximum transmission rate for data; measured in BPS or CPS; bits, characters

## Network Properties

-adapters are used to connect computers to the network; an adapter is needed to connect to any network, whether cabled or wireless

-networks use standard protocols, standard communications hardware and standard software interfaces between the users and the computer systems to maintain open telecommunications

### *3 network properties*

#### **1. Network Architecture**

-purpose of network architecture is to promote open, flexible, and efficient telecommunications environments; are master plans for the development of data communications networks

2 types: peer2peer and client/server; peer2peer is cheaper and available on Windows; client/server is what businesses use

#### **2. Protocols**

-specify a common set of rules and signals that computers on the network use to communicate with each other; responsible for taking data packets from 1 device and sending those packets to other devices; TCP/IP most common

#### **3. Network Topologies**

-network topologies are network structures

#### *2 types of connections*

1. point2point- direct link between 2; computer to printer

2. multi-point- link 3 or more devices

#### *Common configurations of computers with LAN/WAN*

-3 most common are the star, ring, and bus

#### **1. star network**

-passive, all goes through the host; dependent on mainframe, need backup

-has been the main one for a while

#### **2. ring network**

-active, no host, all looped together; less cabling, less expensive, difficult to add more computers; if 1 breaks down, so does the whole network (dual rings to alleviate this)

#### **3. bus network**

-passive; a long bus cable connects everything; if 2 goes down, no big deal; terminator at the end to prevent messages bouncing back

#### **4. star-bus**

-ethernet using star topology; uses a central hub device

#### **5. token ring**

-can use a star-ring topology

### **Connecting Networks to Each Other**

-networks can be connected to each other; a combination of hardware and software is used

**1. repeater-** network device that regenerates and strengthens, and transmits signals between segments of a network

**2. router-** connects several networks; LAN to WAN

**3. bridge-** connects networks of the same type; directs the network traffic based on the destination address of the packet that is being sent

**4. gateway-** connects networks of different kinds

**5. switches-** used to link LANs and to route packets among them

### **Client/Server Networking**

- have become important in business
- the server manages the shared resources, printers, and each client station is there
- puts more computer power in the individual desktops
- known as a **distributed data processing network; cooperative processing**

#### **3 interacting components**

##### **1. presentation component**

- what the user sees onscreen

##### **2. application logic component**

- the logic involved in the processing done by a specific application; distributed applications systems or distributed logic systems

##### **3. data management component**

- the databases and how they are stored

#### **Advantages of**

1. centralized
2. scalable
3. flexible
4. interoperability
5. accessible
6. reduced telecommunications costs
7. thin-client systems

#### **Disadvantages of**

1. expense
2. maintenance
3. operations are completely dependent upon the server
4. distributed data
5. system maintenance is more difficult
6. user access and security are more complex
7. there is a greater need for user training

### **Industry Standardization in Networking**

**\*open system-** produced to public standards; greater connectivity and interoperability

**\*closed system-** developed to specific needs of a company; can't interface with other systems

**1. Open Systems Interconnect OSI-** developed by the International Organization for Standards; allows different types of computers to communicate

**2. Integrated Services Digital Network ISDN-** provides international standards for voice, data, and video communications over telephone lines

-broadband modems have become more standardized today

### **Advances in Telecommunications Systems**

#### **2 trends revolutionizing telecommunications and thus networking**

1. conversion from analog technology to digital technology
2. conversion from copper wire-based media to fiber-optic lines and wireless technologies

### **Network auditing**



-IA needs to assess the integrity, security, reliability, and performance of networks to determine whether data is being transmitted accurately and in a timely manner

### ***3 phases to audit handling***

#### **1. host identification**

-build databases of the active hosts connected to the network

#### **2. host profiling**

-scan the hosts to identify OS, running network services and version information; data is collected by running port and/or vulnerability scanners against the list of active hosts

#### **3. service profiling**

-monitor inbound traffic to identify what network services are active; using the host profile, data traffic monitoring access lists can be created and installed to monitor and detect network traffic patterns

-primary threat to LAN is P2P, because the client can download malware and infect the computers; so could design a filter to look for any outbound connection attempts on ports from 1025 and up

-network audit software sends dummy data to increase traffic and monitor capacity

### ***Controls for telecommunications systems***

1. sequencing of messages

2. encryption

3. self-checking algorithms

4. network-monitoring software

5. automatic dial-back

6. dedicated lines

7. restart/recovery procedures

-depth of the audit depends on dependence on telecommunications

### **Internet**

-began as ARPANET; first operational packet switching network

-was the first Internet backbone; no backbone today, now there are network access points all along the internet

-now backbone is referred to as the service providers

-domain names for .com and .net are managed by 1 company: Verisign

-domain names are transferred into IP addresses, each computer has an IP address

### **Intranets**

-local network inside a firm that uses Internet technologies to allow those who are part of the intranet to transmit and receive information to and from other members of the intranet

-can still be accessed through the Internet if the users have the right passwords, so security is still limited

### **Extranets**

-intranet within a company that still allows access by suppliers and customers

-companies may establish VPNs using the internet; or could set up a dedicated line to avoid the Internet

## **6. Databases**

-series of related data files that are combined in 1 location to eliminate unnecessary redundancy of data within a system or firm

### **Database Development**

-used to be stored as flat files; sequential set of records; could be in text, code or some other delimited format

**\*relational database**- most common; data is stored in tables rather than flat files

-everything is defined to begin with, records and fields are structured, which gave way to the logical data structures: hierarchal, network, and relational

-DBMS can be used to change tables after they have been created and can include programming languages

### **Data Hierarchy**

-data is organized into a data hierarchy when it is stored in computer files

#### **1. bit**

-binary digit, lowest level of information

#### **2. byte**

-8 bits, can represent a single character, such as a letter

#### **3. data field**

-a field, representing anything, such as an account balance

#### **4. record**

-formed by several fields

#### **5. file**

-a set of common records

#### **6. database**

-several computer files

### **Database Structure**

-databases are structured according to 1 of several models; which is used depends on the relationships between the individual records stored in the database

#### **5 fundamental structures used in designing databases**

##### **1. tree, hierarchal**

-organizes information in regular records so each set forms a hierarchy or treelike structure; entity relationships are 1-many; highly structured; suitable for data consisting of tightly coupled records, customer info; accumulate redundant data; can be difficult to query

##### **2. network**

-allows many2many entity relationships among records

##### **3. relational**

-most popular and widely used

##### **4. object-oriented**

-developed as a way to translate techniques of object oriented programming; allows inheritance; used in CAD

##### **5. multidimensional**

-has multi-dimensions

### **Distributed Databases**

-stored in more than 1 location; usually for backup purposes

-must have a way to transfer the data to the other location; **replication**

**\*fragmentation partitioning**- stores most relevant parts in most relevant places

### **Deadly Embrace**

-when 2 processes need each other to proceed, but there is a lock on the both of them; system must have a system of determining which goes first

## **Database Management Systems DBMS**

### ***4 functions***

#### **1. maintaining the common databases**

-updates and maintenance

#### **2. providing the information**

-sharing data

#### **3. providing reporting capability**

-quick and efficient

#### **4. maintaining the security**

-properly backed up; security is in place; has a data dictionary file which includes authorized users

-DNMS is an interface between users and the database; creates a schema of the database

-the schema is the plan or design for the database; subschemas are the uses that will be required of the database

### **Database use and Maintenance**

-usually updated by means of transaction processing programs that utilize data manipulation language DML; query is made using a query language

-SQL is a DML and a query language and a data definition language DDL, which is used by the database administrator to create or modify the structure of the database

-standard language as by the ANSI; all relational databases use this, but all business have a graphical user interface GUI that allows them to modify their SQL

-HTML also integrates SQL and DBMS commands into the language

-DBMS also allows quick sorting of database records

-DBMS usually include 1 or more programming languages, so that only the name of the data item is needed; thus, the application programs are different from the physical arrangement of the data

-applications that access the data are independent of the data itself; similar to excel spreadsheet where you can change the cell but not the formula

### **Database Administrator**

-person who has overall responsibility of developing and maintaining the database

-only he should be able to update the database dictionaries

-once the database is created, find out how to store the data 1 way is simple, but may need multiple ways in case of issue

-very important position

### **Auditing Databases**

-much legislation governing databases; main issue is identity theft; most can be traced to employees who have access to the databases

-selectively encrypting each data item is a good idea; a firewall is good but if the firewall gets broken the entire database is open

-credit card numbers and SSN should be encrypted

-temporary access IDs, fire-call IDs, should have all their actions verified

### ***Auditing databases***

1. who has accessed the data

2. when the data was accessed

3. what computer program or client software was used to access it

4. what location on the network was it accessed from

5. what SQL query was used to access the data
  6. was the access successful
  7. if the access was successful, how many rows of data were retrieved
- most DBS have built in software, but can be disabled

### **7. Electronic Data Interchange EDI**

- earliest form of B2B e-commerce
- automates repetitive transactions; JIT systems
- can travel over the internet or point2point; internet becoming more popular
- needs a standard to work: ANSI or EDIFACT
- in P2P, each company must purchase software; over the internet VPN or a 3<sup>rd</sup> party service bureau may be used; value added network VAN may be used by large companies

#### ***Benefits***

1. necessary for smaller firms
2. reduce conflicts and bettered communications because of standardization
3. forecasting is improved by more timely and accurate data
4. processes are streamlined; reduced costs
5. accuracy increased, since data not entered manually

#### ***Costs***

1. time negotiating contracts
  2. time spent to select VAN providers
  3. employee training
  4. reengineering the affected applications
  5. hardware and software for new system
  6. added security costs and control procedures
- many audit and control considerations present themselves with EDI

### **Electronic Payment Processing**

- most rely on credit card processing; shopping carts
- EFT, electronic funds transfer systems are used as well

### **Enterprise Resource Planning**

- ERP is a business operating system

#### **Components**

1. production planning
  2. integrated logistics
  3. accounting and finance
  4. human resources
  5. sales, distribution, and order management
- any subdivision by itself is not ERP; SAP
  - all data for entire company stored in an enterprise wide database, data warehouse; use data mining to sift through data
  - advantages include better efficiencies and quicker availability; disadvantages include cost and complexity
  - reengineering makes auditing these systems difficult
  - IA must be involved with: 1)evaluation and selection of ERP system 2) maintaining the integrity and security of such systems—upgrade releases and custom changes

## III. Engagement Tools

### 1. Sampling Fundamentals

-both an effective and efficient method of testing account balances or groups of transactions

-competence of the evidence obtained will be determined by the auditor and is not impacted by the design of the sample

#### *2 types*

#### **1. judgment (nonstatistical) sampling**

-auditor determines the sufficiency, uses professional judgment, and the size and design

#### **2. statistical (probability or random) sampling**

-objective approach

#### *2 Uses*

#### **1. tests of controls**

-attribute sampling

#### **2. testing of accounts and transactions**

-variables sampling

### Sampling Risk

-sampling risk arises from the fact that the sample may not represent the entire population; some times 0 sample risk is acceptable

#### *Substantive tests of details- 2 risks*

-testing of an amount by using samples

#### **1. risk of incorrect acceptance**

-conclusions drawn will be incorrect

#### **2. risk of incorrect rejection**

-not a big deal, because auditor can use a different testing method; just result in more work

#### *Tests of controls- 2 risks*

-tests of internal controls that must be performed when trying to assess control risk at below the maximum

#### **3. risk of assessing control risk too low**

-controls are working when they are not; this information will be relied upon too much

#### **4. risk of assessing control risk too high**

-system does not work when it really does; cause more work than needed

-confidence level can be used to assess sampling risk; 5% risk of incorrect acceptance, 95%

\***alpha risk**- makes the audit less efficient; does more work than needed; 2 and 4

**\*beta risk**- cause the audit opinion to be wrong; 1 and 3; reduce effectiveness; what the auditor needs to worry about

### ***Types of Sampling***

#### **1. attributes sampling**

-testing of internal control; is something being properly authorized

#### **2. variables sampling**

-testing for the amount; substantive tests

#### **3. dual-purpose sampling**

-combines controls and substantive testing

-if done and the controls are not effective, must redo the substantive tests as well

-sample size needed is larger than either test, but smaller than both tests combined

### **Determining sample size**

-size will be determined by the use of tables and formulas

1. population size
2. acceptable risk of error
3. variability of items within the population
4. tolerable deviation rate

-2 different formulas for attribute and variables sampling

### **1. Attributes (Control) Sampling**

#### ***Considerations:***

1. relationship between the item to be tested and the objective of the test of controls
2. maximum number of deviations
3. expected number of deviations
4. auditor's acceptable risk of assessing control risk too low
5. characteristics of the items in the population

-anytime the auditor is unable to test something, this is a deviation; if that item has been properly voided, select another item and write void on it

-a deviation in the test of controls does not mean a mistake in the financial statements because the client or auditor could catch it before

#### ***Methods***

#### **1. acceptance sampling**

-quality control tool; is it acceptable or not

#### **2. sequential sampling**

uses a number of steps; when a step deviates stop

#### **3. discovery sampling**

-looking for any single deviation; fraud examinations

#### **4. stop-or-go sampling**

-increase the sample size exponentially until it is acceptable

#### ***Methodology***

1. determine the objective of the plan
2. define the population and sampling unit
3. determine what is a deviation
4. determine the tolerable rate of error
5. determine the confidence level (level of reliability)
6. determine the expected population deviation rate

7. determine the method of selecting the sample
8. calculate the sample size
  - consider: control risk too low, size of the population, expected deviation rate, tolerable deviation rate
9. select and test sample items
10. evaluate the sample results
11. reach an overall conclusion
  - actual error rate + sampling error rate < tolerable error rate
12. document the sampling procedure

## **2. Variables Sampling**

-to test the dollar amount of an account or balance

### ***Considerations:***

1. relationship between the population being tested and the audit objectives
2. allowable risk of incorrect acceptance
3. control risk
  - higher the control risk, larger the sample size needed
4. characteristics of the population
  - diversified or similar
5. tolerable misstatement
  - as tolerable error increases, sample size decreases
6. materiality levels

### ***Methods***

#### **1. mean-per-unit sampling**

-use the sample mean for the population mean; does not need book value

#### **2. difference estimation**

-finds the average difference between book value and audited amount; get the average error, apply to all population, and get the plus/minus range for the population

#### **3. ratio method**

-ratio between book value and sample audited amount and applies this ratio to whole sample; most effective when book and audited values are similar

#### **4. probability-proportional-to-size sampling**

-monetary unit sampling

-uses the dollar amount of the accounts instead of the total number of accounts

### ***2 characteristics***

1. PPS automatically stratifies the population; good with diverse populations
2. PPS is more effective in the detection of overstatements; because it selects the largest over smallest, better for assets not liabilities, since assets are overstated more than liabilities
  - because PPS automatically stratifies the population, in a low error environment, PPS leads to small sample sizes; in high error, PPS leads to big sample sizes because the same item may be selected more than once
  - so, you test 3% of the population but cover 58% of the balances

### ***Variables needed***

1. reliability factor for overstatement errors
2. expected error rate

3. tolerable rate

### **Methodology**

1. determine objectives
2. define the population
3. determine the confidence level
4. determine the expected dollar amount standard deviation (or dollar misstatement)
5. determine the tolerable misstatement
6. select a method of audit sampling
7. determine the sample size
8. select and test the sample
9. evaluate the sample results
10. reach an overall conclusion
11. document the sampling procedure

### **3. Statistical Sampling**

- based on mathematical formulas
- primary benefit is the cost/benefit relationship
- enables the auditor to measure the sampling risk quantitatively
- costs: training, costs of selecting items and designing the tests

#### **Classical Sample Selection Methods**

##### **1. judgment (haphazard) sampling**

- only for nonstatistical

##### **2. random number sampling**

- with or without replacement

##### **3. stratified sampling**

- used when the population is highly diversified; break it into stratas; strata with highest standard deviation gets the most sampling

##### **4. systematic sampling**

- pick a starting point and get an interval; every 15th

##### **5. block sampling**

- best for application of a new control or over time; not representative

#### **Random Number Table**

- use a consistent method; does not matter how many digits are used

### **2. Probability**

- gives us a means of determining chance

#### **2 Requirements**

1. values assigned to each must be between 0 and 1
2. all values must add up to 1

#### **Conditional probability**

- probability that the second event will occur given that the first event has already occurred;  $1 * \text{conditional probability of 2}$

#### **Joint probability**

- probability of 2 or more events occurring together
- multiply their probabilities together:  $1 * 2$

#### **1 or both**



-sum of their individual probabilities – joint probability\

### ***3 methods of assigning probability***

#### **1. classical method**

-each outcome has an equal chance

#### **2. relative frequency method (objective method)**

-different chances for each; analytical

#### **3. subjective method**

-different chance, but use subjective opinions

### **Discrete and Continuous Random Variables**

\***discrete**- has to 1 of certain values

\***continuous**- any value; we need an interval probability distribution

-we can get a probability distribution

\***expected value, mean, average**- of a discrete random variable is the weighted average of all the possible value

\***variance**- sum squares of all the deviations from the mean

\***standard deviation**- square root of the variance; measured in same units as the variable

\***normal distribution**- 68% of the values lie within 1 standard deviation of the mean or expected result

-normal probability distribution takes on the bell curve; 68, 95, 99.7

### **Risk, Uncertainty, and Expected Value**

-uncertainty is risk that can't be measured

-risk is measured by variance and standard deviation

-for situations with risk and uncertainty, we use expected value or expected return; the standard deviation is the measurement of risk associated with that decision

\***coefficient of variation**- std./expected return

-risk per unit of expected return

## **3. Data Gathering Tools**

### **Interviewing**

#### ***4 types***

1. preliminary
2. fact-gathering
3. follow-up
4. exit

-surprise interviews should be conducted only when frauds or something like that

#### ***Steps***

1. planning
- direct and indirect questions
2. scheduling
3. opening
4. conducting
5. recording

-audio recordings made only if necessary and with the consent of the party

6. assessing

### **Questionnaires**

-assessments of internal controls; only as good as the person who develops it and the questions asked

-differ up the questions

### **Surveys**

-questionnaires sent outside the organization

-avoid non-response bias; many will not respond, which means those received may not be indicative of the population

### **Observation**

-best way to test segregation of duties

-best for testing existence not completeness

### **Checklist**

-to test completion of tasks; see if steps are being omitted

### **Rating Scales**

-can determine strength of feelings

## **4. Analytical Review Techniques**

-ratio analysis, variance analysis, other reasonableness tests

### **Ratio Analysis**

-based on accounting data

-trend of a single company over time or other companies or industry averages

### **Solvency ratios**

-measure short-term viability of a business

**1. current ratio**= current assets/ current liabilities

-most commonly used; aggressive financing policy have low; conservative have high

-current ratio should be proportional to its operating cycle

**2. quick ratio, acid test**= cash + net receivables + marketable securities/ current liabilities

-more conservative method; does not include inventory

**3. defensive interval ratio**= cash + net receivables + marketable securities/ daily operating cash flow

-number of days the company can meet its basic operating costs

**4. working capital**= current assets – current liabilities

-current assets do not earn profit for the company however

### **Leverage ratios**

-firm's use of debt to finance operations

**1. leverage factor ratio, equity multiplier**= avg. total assets/ avg. common equity

-higher the ratio, greater the leverage and risk

**2. debt to equity**= total debt/ shareholder's equity

-resources provided by creditors to those provided by shareholders

**3. debt ratio**= total debt/ total assets

-% funds provided by creditors

**4. times interest earned, interest coverage**= earnings before interest and taxes/interest expense

-high is desirable; margin of safety over fixed interest charges

**5. fixed charge coverage ratio**= EBIT + long-term lease payments/ interest + long term lease payments

-includes other items from 4

**6. operating cash flow to total debt**= operating cash flow/total debt

-high ratio is desirable

### ***Asset management ratios***

-measure the firm's use of assets to generate revenue and income; liquidity

**1. inventory turnover**= cost of sales/ average inventory

2. number of days inventory held= 365/inventory turnover

3. accounts receivable turnover= net credit sales/ avg. accounts receivable

4. number of days receivables held=365/receivables turnover

5. operating cycle= days sales in inventory + days sales in receivables

6. cash cycle= days sales in inventory + days sales in receivables – days purchases in payables

### ***Profitability ratios***

-measure earnings relative to some base

**1. profit margin**= NI after interest and taxes/ net sales

2. Dupont equation= NI after interest and taxes / average total assets

**3. net operating income to sales**= EBIT/ net sales

**4. ROA, ROI**= NI / avg. total assets

**5. ROE**= NI – preferred dividends/ avg. book value equity

-there are many limitations however

## **5. Variance Analysis**

-process of comparing actual costs to those budgeted

\***standard cost**- computed at the beginning of year and used for comparison

-ideal, practical, normal, (3 year average) or master budget (current planned) levels of output can be used; normal or master is what is used

### **1. Direct materials variances**

\***total material, flexible budget variance**- actual DM costs – standard DM costs

\***quantity variance**-  $(SQ - AQ) * SP$

-how much of total due to quantity differences

\***price variance**-  $(SP - AP) * AQ$

-how much of total due to price differences

### **2. Direct labour variances**

\***total labour, flexible budget variance**- standard DL costs – actual DL costs

\***labour rate variance**-  $(SP - AP) * AQ$

-how much of total was due to rate differences

\***labour efficiency variance**-  $(SQ - AQ) * SP$

-how much of the total was due to quantity differences

### **3. Factory overhead variances**

#### ***Variables***

\***total variable overhead, flexible budget variance**- flexible budget amounts – actual variable overhead incurred

\***variable overhead spending variance**- standard application rate – actual application rate \* actual quantity;  $(SP - AP) * AQ$

\***variable overhead efficiency variance**- standard activity level for actual output – actual activity level \* standard application rate;  $(SQ - AQ) * SP$

**Fixed**

**\*total fixed overhead variance-** applied fixed overheads (standard rate \* standard for actual output) – actual fixed overheads (money actually spent)

**\*fixed overhead production-volume variance-** applied amount of fixed overhead – budgeted fixed overheads

**\*spending(fixed overhead budget) variance-** budgeted fixed overheads (static budget amount) – actual fixed overhead

**4. Sales variances**

-variance analysis is used to assess the selling department as well as the production department; if revenue is different than budgeted it may be due to selling more or less than expected or because the selling price is higher or lower; or a combination

-opposite of cost variances because we are looking at revenues rather than expenses

-when calculating sales variances, we use the standard contribution margin per unit instead of sales price because fixed costs remain constant

**\*contribution=** sales price – variable costs

**\*total sales variance=** total budgeted – total contribution

**\*sales price variance=** actual contribution per unit – standard contribution per unit \* actual quantity;  $(APg - SP) * AQ$

-measures the impact of the difference in contribution margin per unit

**\*sales volume variance=** actual sales volume – budgeted sales volume \* standard contribution per unit;  $(AQ - SQ) * SP$

-measures the impact of difference in sales volume

-if a flexible budget is used, there will be no sales volume variance, because the actual sales will be equal to the budgeted sales; there can only be a sales volume variance when the actual results are compared to the static budget

**6. Other Reasonableness Tests****1. correlation analysis**

-used to measure the relationship between 2 or more variables

**\*coefficient of correlation-** strength of linear relationship between 2 variables; between -1 and 1; -1 means perfectly inverse and 1 perfectly direct

**\*coefficient of determination-** square of the coefficient of correlation and represents the % of the total variance explained by the regression equation

**2. regression analysis**

-find trends; single or multiple

**7. The Decision-Making Process*****Rational decision making model***

1. there is a single, well-defined goal and we are to maximize that goal

2. all relevant and feasible options are known

3. the criteria and options can be assigned numerical values and ranked

4. preferences are constant

5. will choose the option with maximum benefits

**Programmed and Nonprogrammed Decisions**

-programmed are for routine and are governed by rules; can be delegated easily

-nonprogrammed are complex and much less in frequency

## **Decision-Making Styles**

\***analytical**- characterized by a process and a structure; large firms

\***intuitive**- characterized by informality and hunches; single person

### ***Theory of Constraints***

-there is always a limiting factor; find this constraint and minimize it

### ***The Steps of Decision Making***

#### **1. Define the problem**

##### ***3 steps***

1. assess the reality of the current situation
2. determine what the desired solution is
3. what is the gap between now and the desired solution

##### ***Problems***

1. bounded rationality
2. defining the problem based on the solution that we have
3. concentrate our attention on things not important
4. address the result of the problem and not the problem

#### **2. Identify the possible solutions**

##### ***Methods***

1. attribute listing
2. blast, then refine- start from scratch
3. brainstorming
4. creative leap-solve the problem backwards
5. Delphi technique- eliminates groupthink, but takes long
6. Edisonian approach- last resort; trial and error method
7. free association- first thing that comes to mind
8. synetics- small diverse group brainstorm
9. value analysis
10. morphological matrix analysis- uses matrices

#### **3. Evaluate the different solutions**

1. operations research- applies math formulas
2. simulations
3. sensitivity analysis
4. linear programming
5. queuing theory- solves waiting in line problems
6. decision trees
7. monte carlo method

-because of time and money constraints, most will normally just go until they find a satisficing decision; could also optimize or dissolve so the issue won't occur

#### **4. Make and implement the decision**

-make the one that maximizes our benefit; could be positive for some and negative for others; looks great on paper may still fail

#### **5. Follow-up**

-follow up with the people it affects

## **Decision Making Errors**

### **1. framing error**

-judging information by the way it is presented to us

### **2. escalation of commitment**

-refuse to stop something, when it is obviously wrong, because it is our idea

### **3. overconfidence**

-whatever decision is made is correct because of the person that makes it

## **8. Computerized Audit Tools and Techniques**

-many advantages computers have brought us; embedded audit modules sit in programs and flag transactions that don't fit

-computer related issues are: input, output, and processing controls

### **Testing the computer system**

-3 main techniques

#### **1. test data**

-make up data and feed it through

#### **Issues**

1. false data not make it into real system
2. false data includes all options
3. program is actually the one being used

#### **2. integrated test facility ITF**

-makes a false company in the records

#### **3. parallel simulation**

-use actual client data and run it through a known working system

#### **4. tagging and tracing**

-tag a transaction and trace it through the system

#### **5. controlled reprocessing**

-gets a verified copy of the program and runs it through

### **Computer-Assisted Audit Techniques CAAT**

-CAATs are systems-based or transactions based software that automatically extracts and analyzes data

#### **4 Types**

1. generalized audit software GAS
2. utility software- spreadsheets
3. application software tracing and mapping
4. expert systems software

#### **11 major functions**

1. aging
2. identifying
3. exporting
4. extracting
5. identifying
6. joining and merging
7. selecting
8. sorting
9. stratifying amounts

10. summarizing data
11. adding fields together

## **9. Process Mapping**

1. flowcharts

### **5 main elements**

1. data sources
2. data destinations
3. data flows
4. transformation processes
5. data storage

### **2 types**

1. systems or horizontal  
-has control points and shows segregation of duties
2. program or vertical  
-not used much now

\***data flow diagram**- graphic illustration of a system's processes and data flows

2. narratives
3. diagrams
4. pictorials

## **CMA**

### **Internal Controls**

-effectiveness and efficiency of operations; reliability of financial reporting; compliance with applicable laws and regulations

Legislative Issues

**1) Foreign Corrupt Practices Act (FCPA)**- anti-bribery and accounting provisions

-places responsibility on everyone

**2) Treadway Commission**, The National Commission on Fraudulent Financial Reporting- COSO

-places responsibility on the person preparing the financial reports

-6 steps= tone set by top management; properly designed internal accounting and auditing functions; audit committees are independent directors only; management and audit committee are involved; second opinions; quarterly reporting

**3) Internal Control- Integrated Framework**- control environment; risk assessment; control activities; information and communication; monitoring

-control activities- preventative, detective, directive, corrective, compensating

-3 objective categories- financial reporting, operations, and compliance

\***segregation of duties**- authorize, record, physical custody, periodic reconciliation

### **Internal Auditing**

- to review and appraise policies, procedures, plans, and records for the purpose of informing and advising management
- report to board of directors via audit committee
- do not assess risk or make conclusions
- rely on competence and objectivity

### **Engagements**

- 1) **Operational, performance audit**- efficiency, effectiveness, economy; policies, procedures, decision-making
- 2) **Compliance audit**- policies, procedures, standards; causes and costs
- 3) **Quality audit**-
- 4) **Audit of financial controls**- controls and accounting of financial resources
- 5) **Audit of financial statements**- existence, completeness, rights, valuation, presentation
- 6) **Specialty engagements**- due diligence and fraud audit

### **Planning**

- identify types of potential misstatements, consider the factors relating to risk, and design substantive tests

\***systems, horizontal flowchart**- shows different departments or functions involved in a process

\***programs, vertical flowchart**- depicts specific steps in a process and how they will be executed

- assess risk before planning or implementing

\***inherent risk**- just because

\***control risk**- internal control does not work

\***detection risk**- something won't be detected

-AR= IR\*CR\*DR

- develop the audit program after risk assessment

### **Audit Evidence**

\***sufficient**- enough of it

\***competent**- reliable

\***relevant**- consistent with

\***useful**- helpful with

-2 frauds= financial reporting and embezzlement

-oral and interim reports

-written report= summary, forward, purpose, scope, opinion, findings

-objective, clear, concise, timely, and constructive

-only the auditor changes the report

-Report- fraud, violation of laws, inconsistent product quality, and others

-follow up and do systems control

### **Classification of Systems Controls**

\***general controls**- relate to the environment within which transaction processing takes place

- 1) organization and operation- segregation of duties most important
- 2) general operating procedures



- 3) equipment and hardware controls
- 4) access controls- logical(internet firewalls) and physical security
  - IS personnel should be separate from the departments they support
  - separate and authority and responsibility for the function within IT department

### **Program Development System Stages**

- 1) statement of objectives stage
- 2) investigation and feasibility study stage
- 3) systems analysis stage
- 4) systems design and development stage
- 5) systems implementation stage
- 6) systems evaluation and maintenance stage
  - network hardware controls- checkpoint processing, routing verification procedures, message acknowledgement procedures
  - error correction= parity check, block parity check, convolutional and block codes, Reed-Solomon codes

**\*application controls-** specific to individual applications

- 1) input controls- data is entered correctly
  - data observation and recording, data transcription, edit tests
- 2) processing controls- no transactions have been lost or incorrectly added
  - data access and data manipulation controls
- 3) output controls- valid output
  - validating processing results, printed output controls

### **Internet Security**

- user account management, firewall, anti-virus, encryption
- viruses, Trojan horses, worms
- spoofing, phishing, DOS, theft, copyright infringement
- port scan and sniffer
- password cracking, war dialing, logic bombs, buffer overflow
- social engineering and dumpster diving
- secret vs. public/private key

# CPA Auditing and Attestation

## **I. Introduction and General Field Standards**

1. Introduction
2. Decision to Accept a Client
3. Document Engagement Understanding
4. Planning the Engagement
5. Review and Evaluation of the Internal Control Structure
6. Consideration of Fraud in Financial Statements
7. Illegal Acts by Clients
8. Auditor's Consideration of Internal Audit Function

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2. Audit Tests
3. Special Audit Procedures and Problems

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4. Communications Between Predecessor and Successor Accountants- Non-Public Companies
5. Review of Interim Financial Information- Public Companies
6. Special Reports
7. Reports on the Application of Accounting Principles
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#### **VI. The Audit Sampling Process**

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1. Auditor Responsibilities/Methodology- Internal Controls
2. Auditing a Computer System Without Using the Computer
3. Reports on the Processing of Transactions By Service Organizations
4. Definitions
5. Flowcharting Symbols

# I. General Field Standards

## Introduction

-objective of the audit of financial statements: the expression of an opinion on the fairness with which they present financial position, results of operations, and cash flows in conformity with GAAP- if illegal acts uncovered, determine their effect on

\***unqualified reports**- no qualifications, all is good

\***qualified report**- issued when an auditor takes exception to a material item or items in the financial statements because of departures from GAAP

\***adverse report**- issued when the auditor feels that the departures from GAAP are serious enough to render the statements misleading

\***disclaimer report**- issued when the auditor's examination was incomplete (scope restrictions because of nature of examination or other audit restrictions) to the point where he was unable to express an opinion on the financial statements or where the uncertainties have a pervasive and material effect on the financial statements

\***material weakness**- a condition where control procedures are not suitably designed or operating effectively to prevent or detect an irregularity in the normal course of business by employees performing their designed functions; which leads to accounting records and financial statements not being correct

\***reportable condition**- a situation in the control structure that may be designed ineffectively or not operating properly, but the defect has no effect on the timely recording and accounting summarizing transactions

-a written report to the audit committee claiming no reportable conditions would not be allowed because of the potential for misrepresentation of the limited degree of assurance associated with the auditor issuing a written report representing no reportable conditions

-reportable conditions do not have to re-communicated each year

-reportable conditions may not be communicated in a document about other topics

-the auditor is responsible for his report only; management is responsible for the statements and disclosures, such as stock information

-the independent's auditor's report should be addressed to the client, the board, or the stockholders, depending on circumstances

-GAAS requires that the auditor understand the entity's control structure and to document the assessed level of control risk; if at maximum no explanation is needed; if less than maximum the reason must be documented

### **3 Generally accepted auditing standards**

1) competence- attain the appropriate balance of professional experience and formal education

-objective review of the adequacy of the technical training and proficiency of firm personnel

2) independence

3) due professional care is to be exercised in the conduct of the audit; critically review all work done by all staff levels

### ***Standards of Field Work***

1. planned

2. internal control structure

3. evidential matter

### ***Standards of Reporting***

1. GAAP

2. informative disclosures

3. expression of opinion

### **Financial statement assertions**

1) valuation or allocation

-obtaining credit approval before shipping goods

2) existence or occurrence

-whether or not recorded sales and receivables are valid and not fictitious; match vouchers with supporting documents

3) completeness

-whether or not sales that have occurred have been recorded; tracing works here

4) rights and obligations

-whether or not the entity owns the receivable

### **2. Decision to Accept a Client**

-successor auditor should ask predecessor auditor why there was a change in auditors; successor initiates; written or oral

-must request permission of client to authorize disclosure

-an auditor may conclude that an audit cannot be conducted if the integrity of the entity's management is suspect

-management philosophy and operating style will have most effect on entity's control environment when it is dominated by 1 or a few individuals

-concluding that the entity's management lacks integrity is a reason not to accept the audit; is preferable to get an engagement before the end of the fiscal year; inadequate understanding of the internal control and inability to perform analytical procedures would not arise until after acceptance of the audit

-the auditor should contact the predecessor auditor to determine if the successor auditor should take the engagement

-should contact predecessor auditor regarding disagreements concerning audit procedures, because they could affect the scope of the audit and the final expression of opinion

### **3. Document Engagement Understanding**

\***engagement letter**- used each time the CPA is associated with the financial statements; purpose is to clarify the nature of the engagement and have management agree to this- management signs the engagement letter; sets forth terms of engagement and the level of responsibility the auditor is assuming; type of service to be performed, dates covered, professional standards to be followed, description of procedures, limited responsibility

for detection of fraud, report on control deficiencies, other work, client assistance, and fees

**\*confirmation letter**- obtained from customers of the client

**\*positive confirmation**- request asks for a reply whether or not the balance is correct; large balances

-return without exception validates from third party the accounts receivable balance

**\*negative confirmation**- request asks for a reply only if the balance is incorrect; used for small balances

-no one account has a material effect on the balance

**\*client representation letter**- required and obtained on the last day of the field work

-client and auditor are most likely to agree upon schedules and analyses to be prepared by the client's staff; methods of statistical sampling, pending legal matters, and evidence to be gathered would be judgment issues for the auditor alone

-the understanding should be documented in the working papers

#### **4. Planning the Engagement**

##### **1<sup>st</sup> standard of field work- planning and supervision**

-an auditor obtains knowledge about a new client's business and its industry as part of audit planning; the auditor should obtain a level of understanding of the industry so as to perform audit along GAAS; allow him to have understanding of events, transactions, and practices that may have a significant effect on the financial statements

-professional scepticism is required by the auditor when completing the audit

-perform analytical procedures, comparing budgets to financial statements, to enhance understanding of entity and industry

-obtain knowledge necessary for audit planning by gaining an understanding of internal control structure

-when planning the audit, control risk is assessed after auditor has obtained knowledge about internal control design, identified potential misstatements that could occur, and then evaluate the internal control structure

#### **5. Review and Evaluation of the Internal Control Structure- SAS 55**

##### **2<sup>nd</sup> standard of field work- review of internal control**

-extent and type of documentation is left to the auditor's judgment

-get an understanding of the internal control to plan and determine the nature, timing, and extent of substantive tests to be performed; the auditor's understanding will help to identify the types of potential misstatements that can occur and the risk of material misstatements

-this gives them the necessary knowledge to plan the audit

-use a flowchart, questionnaire, decision tables, or memos to document understanding

##### ***Components of internal control:***

1. control environment
2. risk assessment
3. control activities
4. information and communication
5. monitoring (accounting system)

##### ***Objectives of Internal Control***

1. financial reporting objectives
2. operational objectives

3. compliance objectives

***Limitations on Internal Control***

1. management's responsibility
2. reasonable assurance
3. inherent limitations

**\*control environment-** consists of management's and the board's philosophy, operating style, attitude to work controls, the entity's organizational structure, and personnel policies and procedures; personnel manuals

**\*accounting system-** consists of the methods and records used to identify, assemble, classify, and record transactions

**\*control procedures-** the policies and procedures established to provide reasonable assurance that specific control objectives are met and include segregation of duties, authorization methods, and independent checks on performance, safeguards over access to assets, computer-based controls

**\*steps** in determining client's control system: 1) inquiry 2) inspection 3) observation

**\*confirmation-** used to verify balances, not test for internal control

**\*lead schedules-** audit work papers that contain unadjusted general ledger amounts for all accounts; to prepare these schedules, the names, account numbers, and unadjusted general ledger amounts must be determined

**3<sup>rd</sup> standard of field work- evidence**

**6. Consideration of Fraud in a Financial Statement Audit- SAS 99**

-factors influencing intentional manipulation- undue emphasis on meeting targets, high turnover of senior personnel, high rate of change in the industry, and insiders selling stock

***Risk Factors***

1. incentives/pressures
2. opportunities
3. attitudes/rationalization

-attribute tests, compliance tests, and tests of controls are all the same thing, and are to determine whether internal controls are actually in place

**\*inherent risk-** the susceptibility of a balance or transaction to an error and materiality judgments; not directly affected by control structure; has no direct bearing on the assessment of control risk

**\*control risk-** the risk that the client's internal control structure will not be effective in preventing, detecting, and correcting errors and irregularities in the normal course of business; at maximum, risk of errors and irregularities in account balances is high

**\*detection risk-** the risk that the auditor's procedures are not sufficiently extensive to discover an error or an irregularity should one exist in an account; minimized with a large sample size

**\*audit risk= IR \* CR \* DR**

-if the auditor does not plan to reduce sample size because of less control risk, then in accordance with GAAS they just have to document the entity's internal control structure; any other action would imply a reduction in sample size from less control risk: performing tests of controls or determining whether material misstatements will be detected

**7. Illegal Acts by Clients- SAS 54**

-if illegal acts by the client are uncovered, the auditor should gain an understanding of the act in order to evaluate their effects on the financial statements; fines and penalties could result which should be recorded in the financial statements

-the auditor should have a reasonable assurance of detecting direct effect illegal acts, but none of detecting indirect effect illegal acts; the audit is supposed to be planned to catch the direct effects just the same as detecting errors and irregularities

-if the client refuses to accept the auditor's report modified for an illegal act, the auditor should withdraw; issue a qualified or adverse opinion; withdraw and indicate reason for in a letter to the board or audit committee

-if auditor is precluded from obtaining sufficient competent evidence about the act, issue a disclaimer

**\*lapping-** occurs when cash/check that is received from a customer is misappropriated and a subsequent cash receipt is credited to that customer's account

-to detect, compare dates checks are listed on bank statements to the dates customer credits are recorded in the customer receivable accounts

-the safeguarding of assets and minimization of irregularities affect the understanding of the control structure and assessment of control risk

### **8. The Auditor's Consideration of the Internal Audit Function in an Audit of Financial Statements- SAS 65**

-to obtain an understanding of an entity's internal control structure, review the descriptions of policies and procedures

-the work of internal auditors affects the CPA's nature, timing, and extent of the audit, including: procedures performed when obtaining an understanding of the entity's internal control, procedures the auditor performs when assessing risk, and the substantive procedures performed

-when judging the internal auditors work, the CPA must consider: materiality of financial statements, the risk of material misstatement, and the degree of subjectivity of evidence assertions- assertions about fixed asset additions, which involve a low degree of subjectivity and have a lower risk of material misstatement, will affect CPA's audit

-existence of contingencies, valuation of intangible assets, and valuation of related party transactions have high risk or involve high degree of subjectivity and therefore may not be useful to CPA



## II. The Third Standard of Field Work- Evidence

### 1. Evidential Matter-SAS 31

#### *Nature of Assertions*

1. existence or occurrence
  2. completeness
  3. rights and obligations
  4. valuation and allocation
  5. presentation and disclosure
- evidential matter must be corroborating in nature

#### *Competence of Evidential Matter*

1. valid
2. relevant

#### Sufficiency of Evidential Matter

1. persuasive
2. convincing

### 2. Audit Tests

#### *2 Types*

1. tests of controls- evaluate the effectiveness of the design and operation of internal controls
2. substantive tests- detect material misstatements in financial statements

#### *4 Tests*

1. analytical procedures
2. inquiry and observation
3. transaction testing
4. tests of balances (details)

-specific and general audit objectives for: cash, accounts receivable, notes receivable, inventories, fixed assets, investments, prepayments deferred charges and intangibles, liabilities, SE, revenues costs and expenses, tax provisions, RE, capital stock

#### *Completeness Assertion*

1. sales cutoff test
2. purchase cutoff test

-audit documentation must consist of working papers and be complete

### 3. Special Audit Procedures and Problems

- related party transactions and use of specialists must be accounted and audited specially
- client's lawyer may need to be contacted for ongoing litigation

- must obtain written representation of management's understanding
- accounting estimates must be evaluated for reasonableness
- communication with audit committees must be timely and efficient

## III. Standards of Reporting

### 1. The Auditor's Report

-covers: BS, IS, RE, SCF; must be presented fairly

#### 3 Paragraphs

1. introductory
2. scope
3. opinion

### 2. The First Standard of Reporting

-must state whether the financial statements are presented in accordance with GAAP

### 3. The Second Standard of Reporting

-shall identify those circumstances in which such principles have not been consistently observed in the current period in relation to the preceding period

-accounting changes: change in accounting principles or reporting entity; errors; changes in classification of items

### 4. The Third Standard of Reporting

-informative disclosures in the financial statements are to be regarded as reasonably adequate unless otherwise stated in the report

-subsequent events must be included

### 5. The Fourth Standard of Reporting

-shall discuss whether the statements as a whole are fair, or if there are issues; the reasons should be stated; should contain an indication of responsibility the auditor is taking if his name is on the statements

### 6. Other Reporting Considerations

-scope limitations, uncertainties, auditor's consideration of an entity's ability to continue as a going concern

-auditor must also consider: conditions and events, management's plans, financial statement effects, effects of the auditor's report

### 7. Using the Work and Reports of Other Auditors

-auditor must determine whether he is the principal auditor; the principal auditor must get primary decisions

### 8. Other Information in Documents Containing Audited Financial Statements

-all organizations may have other information they want included

-auditor's responsibility is to ensure that only the necessary information is included

-if issues arise, the auditor can: revise statements, withhold them, or withdraw from engagement

### 9. Reports on Comparative Financial Statements

-must report on: comparative financial statements, reports with differing opinions, reports with updated opinions different from previous opinions, reports of predecessor auditor

### 10. Association with Financial Statement

- various circumstances will require modifications
- disclaimer of opinion must be included when not independent
- opinions may need to be disclaimed on unaudited financial statements
- some supplementary information may need to be included

### **11. Reporting on Condensed Financial Statements and Selected Financial Data**

- financial statements can be condensed as well; selected financial data can be segregated for auditing

# IV. Attestation, Government Standards, and Quality Control

## Standards

### 1. Attestation Standards

#### *3 Elements of*

1. practitioner engaged to issue or does issue a written communication
2. written report expresses a conclusion about the reliability of a written assertion made by a party on a subject matter or directly on the presentation of the subject matter itself
3. practitioner's report and the written assertion is used by or expected to be used by a third party

#### *Levels of Attestation*

1. positive assurance- reports that express conclusions on the basis of an examination
2. negative assurance- reports that express conclusions on the basis of a review
3. reporting on the application of agreed upon procedures

#### *Types of Reports*

1. examinations- highest level of assurance
2. review- less stringent than examinations
3. agreed-upon procedures- solely to meet the needs of specified users

#### *Attestation Engagements*

1. descriptions of internal control structure
2. descriptions of software
3. compliance with statutory, regulatory, and contractual requirements
4. investment performance statistics
5. information supplementary to financial statements

#### *Not Attesting*

1. auditing
2. management consulting
3. tax preparation or advice
4. role is solely assisting: expert opinions, company accountant

### 11 Standards

#### *General Standards*

1. must be qualified to perform attesting function
2. have adequate knowledge and technical proficiency
3. 2 conditions: assertion can be compared and measured
4. independence
5. due professional care

#### *Field Work Standards*

1. planned and supervised

2. evidence obtained

### ***Reporting Standards***

1. identify assertion and nature of report
2. conclusions
3. reservations
4. limiting use statement

### **2. Reporting on an Entity's Internal Control over Financial Reporting**

-as of a point in time

### **3. Compliance Attestation**

-must be an examination or agreed-upon procedures; reviews are prohibited

### **4. Financial Forecasts and Projections- Prospective Financial Statements**

-same formats are used and guidelines are followed

### **5. Reporting on Pro Forma Financial Statements**

-used for monte analysis: what statements would like at different dates had things been different due to: business combinations, disposition of part of business, proposed sale of securities

-used to show what effects certain events had

-same reporting and such

### **6. Agreed Upon Procedures**

-issue a report of findings on if rules are being followed

### **7. Statement on Government Auditing Standards**

#### ***Types***

1. financial audits- financial statement; financial related
  2. performance audits- economy and efficiency; program audits
- standards: qualifications, independence, due professional care, quality control

### **8. Compliance Auditing Applicable to Governmental Entities and Other Recipients of Governmental Financial Assistance**

-follows exact same guidelines as everything else

### **9. Reporting Examples- Governmental Auditing Standards**

2 Types

1. report on internal control structure
2. report on compliance with laws and regulations

### **10. Single Audit Act**

-refers to government units and such that spend public monies or are public companies and they must get at least 1 audit per year

### **11. System of Quality Control for a CPA Firm's Accounting and Auditing Practice**

-same as others: segregation of duties; communication; documentation; procedures

### **12. Monitoring a CPA Firm's Accounting and Auditing Practice**

-same monitoring techniques utilized

## V. Review Compilations, Special Reports, and Other Reports

### 1. Compilation Engagements and Review Engagements- Non-Public Companies

- SSARS is statement of standards for accounting and review series for non-public firms
- \***compilation**- the presentation in the form of financial statements, information that is the representation of management without undertaking to express any assurance on the statements; no assurance, no evidence, no independence, no representation letter
- \***review**- involves inquiry and analytical procedures that provide the accountant with a reasonable basis for expressing limited assurance the statements are correct
- \***nonpublic entity**- any entity other than 1 whose securities are traded or makes filings
- financial statements are prepared the same way, just without mandatory parts
- when there is no review or audit, a compilation should be performed with no mention of procedures performed by auditor; short report
- can be a change in nature of engagement to warrant a review over compilation or vice versa

### 2. Reporting on Comparative Financial Statements, Compilation and Review Engagements- Non-Public Companies

- follow all same rules and regulations when needed

### 3. Compilation Reports on Financial Statements Included in Certain Prescribed Forms- Non-Public Companies

- prescribed forms are standard forms; use them

### 4. Communications Between Predecessor and Successor Accountants- Non-Public Companies

- same procedures and regulations

### 5. Review of Interim Financial Information- Public Companies

- same procedures as for annual reports

### 6. Special Reports

- income tax basis statements; auditing an item in accordance with GAAP; separate negative assurance report
- reports are prepared the same way

### 7. Reports on the Application of Accounting Principles

- reported in same way

### 8. Reporting on Financial Statements Prepared for use in Other Countries

- follow foreign and US guidelines

### 9. Reporting on Information Accompanying the Basic Financial Statements in Auditor-Submitted Documents

- can be disclaimers on part of the information

### 10. Letters for Underwriters and Certain other Requesting Parties

-comfort letters are written by accountants and sent to underwriters discussing accounting and auditing fees and specifics and needs for the underwriting process; not required



# VI. The Audit Sampling Process

## 1. Audit Sampling Defined

-sampling is using less than 100% of the population

## 2. Types of Sampling

-either non-statistical or statistical

## 3. Glossary of Sampling Terms

-many different terms

## 4. Sampling for Substantive or Judgment Testing

### 8 Considerations

1. determine the objectives
2. define the deviating conditions
3. define the population
4. determine the method of selecting the sample
5. determine the sample size
6. perform the sampling plan
7. evaluate the sample results
8. document the sampling procedure

## 6. Application of Statistical Sampling in the Audit Process

-attribute and variables sampling (substantive testing)

**\*discovery sampling-** used when a low error rate is expected; used for testing intentional errors or irregularities

-can use: mean-per-unit; difference estimation; or ratio approaches

## 7. Audit Sampling

-must have sufficient evidential matter

**\*risk of incorrect acceptance-** is correct when it is actually wrong

**\*risk of incorrect rejection-** is wrong when it is actually correct

**\*risk of overreliance-** sample is too inclusive

**\*risk of underreliance-** sample is not inclusive enough

-some samples will be dual purpose

## 8. Audit Risk and Materiality in Conducting an Audit

$AR = IR * CR * DR$

-audit risk, inherent risk, control risk, detection risk (sampling and nonsampling risk)

-likely v. known errors

# VII. Electronic Data Processing

## **1. Auditor Responsibilities/Methodology- Internal Controls**

### **8 Steps**

1. planning
2. document understanding
3. assess control risk
4. completion of review- general controls
5. completion of review- application controls
6. completion of review- preliminary evaluation
7. tests of controls
8. assess control risk

-computers make the audit quicker and more effective

-electronic commerce must be audited

-CAATs are used; special audit routines and generalized software

-computer audit tools: generalized audit software; automated workpaper software; DMS; test retrieval systems; public databases; word processing software; electronic spreadsheets

## **2. Auditing a Computer System Without Using the Computer**

-known input to processing to known output

-usually used with batch processing with detailed audit trails

## **3. Reports on the Processing of Transactions By Service Organizations**

-services will have auditors as well

-they will report on: policies and procedures place in operation; policies and procedures place in operation and tests of operating effectiveness

## **4. Definitions**

## **5. Flowcharting Symbols**

# CFSA – Banking

## **I. Financial Services Auditing**

### **A. IIA Professional Practices Framework**

-audit principles and practices within the banking, insurance, and securities financial services industry

### **B. Internal Control/Risk Management/Governance**

1. Internal Control Frameworks
2. Risk Management Frameworks
3. Governance Models

### **C. Audit Process**

1. Audit Planning
  2. Audit Fieldwork
    - a. Risk Assessment
    - b. Analytical Review
    - c. Data Gathering and Evaluation
    - d. Testing
    - e. Tools and Techniques
  3. Audit Communications
  4. Monitoring Outcomes
- D. Implications of Information Technology

### **E. Auditing Financial Statement Elements**

1. Balance Sheet
2. Statement of Cash Flows
3. Income/Expense Statements
4. Off-balance-sheet Items

## **II. Auditing Financial Services Products**

1. Lending
2. Deposits
3. Trusts
4. Annuities
5. Derivatives
6. Electronic Services
7. Cash Management Services
8. Stocks
9. Bonds
10. Commodities
11. Mutual Funds

- 12. Employee Benefits
- 13. Capital Market Products
- 14. Securities Lending
- 15. Insurance Policies
- 16. Insurance Products
- 17. Foreign Exchange
- 18. Asset Management
- supervision of fund managers' portfolios and valuations
- 19. Money Market Products

### **III. Auditing Financial Services Processes**

#### **1. Risk Management**

- 1. *Asset/Liability Management*
- 2. *Trading Market Risk*
- 3. *Credit, Liquidity, Operational Risk*
- 4. *Allowance for Loan and Lease Losses*
- 5. *Reserves*

#### **2. Underwriting**

- 1. *Loans*
- 2. *Securities*
- 3. *Insurance*
- 4. *Private Placement*
- 5. *IPOs*
- 3. *Securitization*
- 4. *Treasury Operations*
- cash management*
- 5. *Back-office Operations*
- 6. *Marketing Sales and Distributions*
- insurance agencies, bank branches, brokers*
- 7. *Claims*
- 8. *Investments*
- 9. *Broker-dealer Activities*
- 10. *Rating Advisory Service*
- 11. *Mergers and Acquisitions*
- 12. *Loan Operations*
- collateral issues, perfecting liens*

# I. Financial Services Auditing

## A. IIA Professional Practices Framework

-audit principles and practices within the banking, insurance, and securities financial services industry

### Professional Practices Framework

-developed by Guidance Task Force in 1999; organizes the full range of internal audit guidance in a ready accessible timely manner

-includes 3 categories of guidance

### *5 Parts*

#### 1. Definition of Internal Auditing

-independent, objective, assurance and consulting activity designed to add value and improve operations

-brings a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes

#### 2. Code of Ethics

-purpose is to promote an ethical culture in the profession of internal auditing

-states that all internal auditors, whether IIA or not, must perform internal audits in conformance with the Standards

-applies to all entities and individuals involved in internal auditing; IIA members will be held responsible according to the IIA Bylaws and Administrative Guidelines; not comprehensive

### *2 Essential Components*

#### 1. Principles

-integrity, objectivity, confidentiality, competency

#### 2. Rules of Conduct

-expands on the principles with specific examples

#### 3. Standards

-criteria by which the operations of an internal audit department are evaluated and measured; represent practice of internal auditing as it should be

-mandatory guidance

-to be widely applicable, mandatory guidance must be vague in nature; reason for other 2 guidances

### *Purpose of Standards*

1. delineate basic principles that represent the practice of internal auditing as it should be

2. provide a framework for performing and promoting a broad range of value adding internal audit activities

3. establish the basis for the evaluation of internal audit activities

4. foster improved organizational processes and operations

-development and issuance of Standards is an ongoing process

### **3 Sets of Standards**

-attribute and performance standards apply to all internal audit services

-1 set each of attribute and performance standards; 2 sets of implementation standards, A and C

#### **1. Attribute AS**

-address the attributes of organizations and individuals performing internal audit services

#### **2. Performance PS**

-describe the nature of internal audit services and provide quality criteria by which the performance of these services can be measured

#### **3. Implementation ISA and ISC**

-assurance and consultancy standards

-expand on attribute and performance standards, providing guidance for specific engagements; could deal with industry specific, regional, or other specialties

**\*assurance services-** internal auditor's objective assessment of evidence to provide an independent opinion or conclusions regarding a process, system, or other subject matter

-nature and scope of assurance engagements determined by the auditor

3 groups involved: process owner, auditor, user

**\*consultancy services-** advisory in nature, performed at specific request of client

-nature and scope determined by the client

-internal auditor must maintain objectivity and not assume management responsibility

2 groups involved: internal auditor, engagement client

#### **4. Practice Advisories**

-strongly recommended and endorsed by the IIA

-represent best practices endorsed by the IIA to implement the Standards

-may help to interpret the Standards or apply them in specific internal audit environments

-can be general or specific

-submitted for formal review by IIA's Professional Issues Committee or other group designated by the Guidance Planning Committee

-address topics that require current attention

-may have limited lives or may be elevated to Standard status

-available online as well; used to be the Guidelines, many of these were transferred over

-Professional Practice Pamphlets are in process Practice Advisories

#### **5. Development of Practice Aids**

-includes a variety of materials developed or endorsed by the IIA

-provide views from experts on techniques and processes

-can include research studies, books, seminars, conferences, and others

### **International Federation of Accountants IFAC**

-worldwide accountancy profession; 1977

-established the International Accounting and Auditing Standards Board IAASB

#### **6 Parts**

##### **1. Introduction**

-established the International Standard on Auditing ISA

##### **2. Objective of an Audit**

-objective is for the auditor's opinion to be "give a true and fair view" or "present fairly, in all material respects"

-even so, external users cannot assume future viability or management's effectiveness or efficiency

### **3. General Principles of an Audit**

-independence, integrity, objectivity, professional competence and due care, confidentiality, professional behaviour, technical standards

-should conduct audit in accordance with ISA

-auditor should plan and perform audit with professional scepticism that circumstances may exist that will cause the financial statements to be materially misstated

### **4. Scope of an Audit**

-the audit procedures necessary to achieve the objective of the audit

-affected by laws, regulations, nature and terms of audit, ISA requirements

### **5. Reasonable Assurance**

-audit should provide reasonable assurance the financial statements are free from material misstatement

-relates to the accumulation of necessary information

-relates to the whole audit process

-inherent limitations include: use of testing, collusion, most audit evidence is persuasive and not conclusive

-work undertaken by auditor is permeated by judgment: deciding the scope and drawing conclusions

-other issues: transactions of related parties, extraordinary events, errors

### **6. Responsibility for the Financial Statements**

-responsibility is still with management

-public sector audits are essentially the same, but will have different scope limitations due to laws and regulations

## **B. Internal Control/Risk Management/Governance**

-management needs a suitable framework to evaluate effectiveness of internal control

### **1. Internal Control Frameworks**

-process by which the firm's employees provide reasonable assurance of the achievement of: operations controls, financial reporting controls, compliance controls

-since they are effected by people, there are inherent limitations

### **5 Components of Internal Control**

1. control environment

2. risk assessment

3. information and communication

4. control activities

5. monitoring

-COSO and CoCo both stress self-assessment

### **2. Risk Management Frameworks**

-usually measured in terms of likelihood and impact

### **3 Types of Business Risk Assessment**

1. strategic- 5 to 10 years; senior management  
-assessment only
2. process- current period; process or project managers  
-risk management and risk assessment
3. operational- everyday operations; health or safety issues; supervisors  
-risk management

### **Risk Assessment Steps**

#### ***Strategic Risk Assessment***

1. understanding of firm's overall goals and objectives
2. choose strategic risks with greatest importance
3. define all environments important to the organization
4. create matrices with risks at top and environment on side; each matrix is actually a set of 3: short, medium and long term
5. brainstorm and monte carlo analysis
6. combine time horizons for each risk assessment

#### ***Procedure for Risk Assessment***

1. identify risk
2. measure risk/develop alternatives
3. control design
4. risk management

#### ***Operational Risk Assessment***

- includes for temporary workers and visitors
- health, safety, and environmental/physical risks

#### ***Risk Assessment***

1. risk identification
2. risk measurement
3. risk prioritization

#### ***Risk Management***

1. avoid the risk
  2. control the risk
  3. share the risk
- residual risk and control risk must always be considered
  - \***residual risk**- left over risk; if not high, then accept
  - \***control risk**- inherent in the management process

### **4 Results of Control Processes**

- board and senior management contribute
1. financial and operational information is reliable and possesses integrity
  2. operations are performed efficiently and achieve effective results
  3. assets are safeguarded
  4. compliance with laws, regulations, and contracts

### **5 Objectives of Risk Management**

- senior management is responsible, but internal auditors can help
1. risks are identified and prioritized
  2. acceptable risk is determined by board and management
  3. risk mitigation activities are designed and implemented
  4. ongoing monitoring



5. periodic results are communicated to management and the board

### **3. Governance Models**

-2 main ones

#### **COSO**

-started in 1980's to in conjunction with Foreign Corrupt Practices Act 1977

-5 organizations produced this: AICPA, AIA, FEI, IIA, IMA

-emphasizes internal control is a tool and should be built into not onto operating activities

-led to Treadway Commission which published Internal Control- Integrated Framework

#### ***Limitations of Internal Control***

1. human error
2. misunderstanding
3. errors
4. management override
5. collusion
6. cost/benefit

#### ***Internal Control***

1. is a process
2. is effected by people
3. provides reasonable assurance
4. geared to achievement of objectives

#### ***5 Components of Internal Control***

1. control environment
2. risk assessment
3. information and communication
4. control activities
5. monitoring

Enterprise Risk Management ERP

1. align risk appetite and strategy
2. enhance risk response decisions
3. reduce operational surprises and losses
4. identify and manage multiple and cross-enterprise risks
5. seize opportunities
6. improve deployment of capital

4 categories: strategic, operations, reporting, compliance

8 interrelated components: internal environment, objective setting, event identification, risk assessment, risk response, control activities, information and communication, monitoring

#### **CoCo (risk management and governance)**

-now called RMG; Canadian

#### ***3 Objectives***

1. effectiveness and efficiency of operations
  2. reliability of external and internal reporting
  3. compliance with applicable laws and regulations
- leaves responsibility of control with the board

#### ***6 Board Responsibilities***

1. establish and monitor ethical values
2. approve and monitor vision, mission, and strategy
3. oversee external communications
4. evaluate senior management
5. monitor management control system
6. assess the board's effectiveness

### **C. Audit Process**

-every one is unique but follows similar guidelines

#### **1. Audit Planning**

2010- Planning

-risk assessment and inclusion of consultancy engagements

2200- Engagement Planning

-develop and record plan including: scope, objectives, timing, and resource allocations

2201- Planning Considerations

-objectives, risks, risk management and control systems, opportunities for improvements

-for both external usage and consultancy engagements

#### ***2 types of planning***

##### **1. Management's Role**

-management must establish goals and objectives for audit function, outline methods to be used, and appropriate level and types of resources

#### ***Types of Plans***

1. goals for the audit unit
2. criteria to measure progress toward achieving goals
3. target dates
4. audit work schedules
5. staffing plans and financial budgets
6. activity reports

#### ***Work Schedules Based on***

1. length of time since last audit
2. extent and types of finding in last audit
3. degree of risk
4. major recent changes in operations
5. audit staff resources
6. requests by management or policymakers
7. cost/benefits

#### ***Effects from Risk Exposure***

1. loss of assets, errors, fraud
2. bad decisions
3. stakeholder or client dissatisfaction
4. adverse publicity
5. noncompliance with laws, rules, and regulations
6. failure to achieve goals and objectives

#### ***3 Components of Risk***

1. interference

2. probability of an occurrence
3. negative consequences

### ***Risk Analysis Process***

1. identify auditable activities
  2. identify relevant risk factors
  3. estimate significance of risk
  4. estimate likelihood a risk will occur
  5. prioritize risks
  6. determine how to manage risks
- governmental units usually have more audit restrictions

### **2. Specific Audit Planning Tasks**

- should be performed continuously throughout the audit
- examine all major areas

### ***Major Aspects of Planning Process***

1. collect and analyze background information to be audited
- do before objectives are defined; can include surveys; can modify the scope
2. define audit objectives
3. define audit scope
4. determine resources needed in the audit
5. communicate with management about the audit
- formal communication and entrance conferences; in writing
6. determine appropriate methods and strategies
- sampling distribution and substantive or subjective tests
7. develop audit program with appropriate procedures and tasks to achieve audit
- should be updated as necessary

### **2. Audit Fieldwork**

- involves performance standards as well
- purpose of fieldwork is to gather audit evidence for use
- 2300- Performing the Engagement
- identify, analyze, record, and evaluate sufficient information
- 2310- Identifying Information
- sufficient, competent (reliable and valid), relevant
- 2320- Analysis and Evaluation
- 2330- Recording Information
- CAE controls access and dictates retention times and policies
- 2340- Engagement Supervision

### ***3 Uses of Evidence***

1. primary or direct evidence
2. secondary evidence- needs additional evidence
3. corroborative evidence- supports primary or secondary

### ***3 Classifications of Evidence***

1. documentary evidence- logs and such
2. analytical evidence- from other evidence; tests
3. corroborative evidence- from people

### ***4 Elements of Complete Audit Findings***

1. condition
  - what was found
2. criteria
  - what should be
3. cause
4. effect

### ***5 Stages of Audit Fieldwork***

#### **1. Risk Assessment**

2100- Nature of the Work

2110- Risk Management

-include: current risk management system, risk exposures, risks from consulting engagements

-risks become harder to manage the longer they go undetected

#### ***Risk Assessment Process***

1. list potential audit areas
  2. identify relevant risk factors
  3. assess the relative significance of the risk
  4. assess the likelihood that a risk will occur
  5. control the risk, transfer, or accept the risk
- control environment is critical: preventative, detective, and corrective controls
6. ongoing monitoring process

#### **2. Analytical Review**

2240- Engagement Work Program

-work programs should establish procedures and will usually vary

-auditors must be able to corroborate their deductions

#### ***2 Logical Fallacies***

1. inductive fallacy- evidence is used incorrectly
2. deductive fallacy- failure to follow logic of a series of statements

#### ***Specific Logical Fallacies***

1. slippery slope- 1 event will always lead to another
  2. non sequitur- it does not follow; senseless statements
  3. post hoc, ergo propter hoc- after this, therefore because of this
  4. hasty generalization- using limited information to form a bias or prejudice
  5. ad hominem- against the man; prejudice action
  6. false use of authority- use proper resources
- base findings on significant information; may be differences in materiality and significance from engagements

#### **3. Data Gathering and Evaluation**

-working papers must be handled carefully; certain information must be kept secret

-working papers are the connecting link and ensure compliance with the Standards

2300- Performing the Engagement

2310- Identifying Information

2320- Analysis and Evaluation

\***sufficient**- factual and would convince an intelligent person

\***competent**- consistently produces same outcomes

\***relevant**- directly related

-must always use professional judgment and proper data gathering and evaluation techniques

#### **4. Testing**

-testing involves confirming data quality and assertions regarding reliability and relevance

-design test procedures for key control areas and associated activities

-the tests become the foundations for the audit conclusions

-can be analytical (substantive) or subjective testing (interviews, gathering)

-the credibility of information sources is important, as is getting written representations from management

#### **5. Tools and Techniques**

-must audit around and through the computer

##### **CAATs**

1. electronic working papers

2. information retrieval and analysis (to sample or not to sample)

3. fraud detection

4. security review software

5. network security

6. continuous monitoring

7. audit reporting

8. computer-based training

#### **3. Audit Communications**

2400- Communicating Results

2410- Criteria for Communicating

-final reports; opinion, positives, limitations to outside parties, form may vary

2420- Quality of Communications

2421- Errors and Omissions- put it back in

2430- Engagement Disclosure of Noncompliance with the Standards

-which ones reasons, and impacts of

2440- Disseminating Results

-continual communication is important: drafts, any issues as they arise, timelines and delays

-give management opportunity to state concerns, correct mistakes in the draft report, explain remaining steps prior to final release

-audit reports should include everything: mini essay

#### **4. Monitoring Outcomes**

2500- Monitoring Progress

-follow up process and during the audit

-ensure prior issues have been corrected, and the causes, not the symptoms as well

-CAE needs to develop the monitoring program

-some issues may need immediate attention

## **D. Implications of Information Technology**

- auditors must evaluate reliability and usefulness of computer systems
- make sure board and management clearly understand the systems; the system is sufficient, and the board has received assurance reports
- review all information, ensure personnel understand duties, ensure there is a disaster recovery plan, ensure technical and operational controls

### ***5 Important Terms***

1. selection
2. collection
3. classification
4. reporting
5. storing

### ***General Controls***

1. administrative controls
2. controls over computer operations
3. security controls
4. security administration
5. system programmers
6. telecommunications systems
7. systems software

### ***Application Controls***

1. input controls
  2. processing controls
  3. output controls
- ensure there is an appropriate systems development methodology with proper segregation of duties

### **IS audit Standards**

- Control Objectives for Information and Related Technology- COBIT

### ***4 Classifications of COBIT***

1. Planning and Organization PO
2. Acquisition and Development AI
3. Delivery and Storage DS
4. Monitoring MN

## **E. Auditing Financial Statement Elements**

- purpose is to verify: existence, completeness, rights and obligations, valuation, presentation
- must consider: COSO, compliance with laws and regulations, and materiality

### **1. Balance Sheet**

- future performance: can meet financial obligations, amount of money invested in, debt ratio, types assets it holds

### **2. Statement of Cash Flows**

- no non-cash items such as depreciation

### **3. Income/Expense Statements**

- evaluates past and future performance, assesses risk in future cash flows

-does not include information such as goodwill

#### **4. Off-balance-sheet Items**

-usually is just separate subsidiaries or legal entities

-can transfer risk to other shareholders; needs proper disclosure in footnotes

-contingent liabilities also

## II. Auditing Financial Services Products

### 1. Lending

- starting point for loan audit is the loan policy
- types, collateral, evaluation guidelines, write off procedures, collections
- restrictions on related party loans, amounts, and types of loans
- each type of loan should have a separate general ledger control account
- always an allowance for uncollectible loans
- \***exception reports**- generated by lending institutions to identify past due loans
- accrued interest is not recorded after loans become uncollectible; if principal is repaid, must determine how much is principal
- auditor must determine proper policies for uncollectible loans
- also are watch lists for dangerous accounts

### 3 Loans

#### 1. commercial

- short-term working capital, asset-based, seasonal, term, agricultural, floor-plan

#### 2. residential

- secured by mortgages, deeds of trusts, land contracts
- may need credit life insurance to reduce credit institution's risk
- may have full, partial, or negative amortization with a balloon payment

#### 3. consumer

- smaller than residential and repaid every month
- instalment (cars and mortgages) or credit cards

### 2. Deposits

- either interest or non-interest bearing

#### Interest Bearing

- interest bearing include savings accounts and CDs; bear interest for a time and are known as time deposits
- money market accounts pay higher interest than savings accounts
- \***CDs**- pay higher interest rates than savings or money market; have specific maturities and interest rates; interest rates change daily at banks
- \***bearer CD**- payable to the owner
- \***registered CD**- payable to a specific entity or person
- \***negotiable CD**- short-term instruments purchased in large denominations by large companies and pension funds
- \***non-negotiable CD**- sold in smaller denominations; penalty due if it is cashed out before maturity



-longer the time to maturity, greater the interest rates; not great because money has to be tied up

### **Non-Interest Bearing**

-demand deposit accounts; include checking and escrow accounts

-can transfer money via checks, ATM, ETF, POS easily

-the financial institution's general ledger records transactions for deposit accounts; may reject if there is a stop payment or overdraft

-banks must report cash deposits of 10,000 or more a day, regardless of how many branched or deposits

-also must report cashier's checks, money orders, traveller's checks, or bank checks in excess of 3,000; 100,000 deposit insurance

-audit should examine: policies, documentation, interest accrual, separation of duties, fees and penalties, overdrafts, closed accounts in a timely manner

### **3. Trusts**

-trust departments administer trusts, estates, pension accounts, profit sharing accounts, and custodian accounts; also provide services to public companies relating to issuing and maintaining stock transactions

-board of directors is responsible for any trust funds the bank holds; all bank employees participating in trust operations must be bonded

-funds held in trust are not assets of the financial institution administering the trust therefore, records relating to trusts must be segregated from the rest; funds held in trust cannot be reinvested in the financial institution's own securities; banks may transfer funds between trusts unless prohibited by agreement or if it is unfair to 1 of the trusts

#### ***Trust Services***

##### **1. estate settlement**

-banks serve as executors or administrators of estates; assemble, control, inventory, and deceased person's assets; arrange to pay costs, taxes, and claims; distribute the rest according to the will

##### **2. trusts**

##### **3. guardian of estates**

-for minors or incompetent adults

##### **4. co-fiduciary**

-more than 1 party shares responsibilities for the trust

##### **5. agent**

-the bank is the agent when it takes possession of property but the owner retains title; agency accounts at banks include: custodian of property, escrow agent, investment advisory agent, safekeeping agent; also serves as agent when it has power of attorney

#### ***Trusts***

##### **1. living trusts**

-created by individuals for the purpose of owning another's assets during that person's life and for distributing the assets after death; prevents probate for heirs after death

##### **2. testamentary trusts**

-implemented through a will after someone dies

##### **3. charitable trusts**

-established by will or agreement for religious, educational, or community improvement purpose

#### **4. guardianship trusts**

-to provide for someone who has been declared legally incompetent; bank may act as trustee

#### ***Corporate Trust Duties***

-banks have corporate trust departments for governments and large entities to handle issuance, redemption, transfer, and recordkeeping associated with stock and bond issues

-trust agreement or indenture specifies the bank's responsibilities

#### **1. stock transfer agent**

-transfer agent may issue stock certificates to increase shares outstanding, or reissue new certificates when ownership changes

#### **2. bond registrar**

-registers bonds at new issue

#### **3. stock registrar**

-registers stocks at new issue and transfers to prevent over issuance

#### **4. dividend reinvestment agent**

-receives a stockholder's dividends and purchases additional shares for the stockholder

#### ***Retirement Plans***

-bank may be trustee, co-trustee, custodian, or depository for employee benefit and retirement plans

#### **1. pension plans**

-provide retirement income for employees; defined benefit or contribution; when the employer established them they are "defined"

#### **2. self-employed retirement trusts**

-bank may be trustee or custodian for pension and profit sharing plans established for employees by individual owners; Keogh plans

#### **3. individual retirement account IRA**

-banks administer IRA's in accordance with individual agreements and customers; individuals do not pay taxes on deferred income, and additional contributions are tax deductible until withdrawals begin

-audit should focus on: policies and procedures, internal controls, accurate reporting, trust committee: meetings, at least 1 member not a bank officer, reviews of accounts, oversight of trust committee by the board

#### **4. Annuities**

-contract between purchaser (annuitant) and insurer, where the annuitant makes lump sum payments or series of payments to insurer

**\*accumulation period-** when the funds are invested by the stated period by the insurer

**\*payout period-** when the maturity date arrives, the payout begins

-annuities provide the annuitant with tax-deferred earnings; beneficiary gets payments if the annuitant dies

-have withdrawal provisions that allow withdrawal of a small % each year; withdrawal charge only if annuitant withdraws more than allowed

-also have surrender values; will also have surrender charges if it has not been in service for a specified amount of time

## 2 Types

### 1. fixed annuities

-guaranteed amount of interest

### 2. variable annuities

-more like an investment option, but still with insurance guarantees; usually has several mutual funds to choose from

-for both types, the insurance company assumes mortality risk and administrative expenses for a fee

### *Equity Index Interest Rate Common Features*

-insurer may still guarantee a minimum return; index-linked

#### 1. participation rate

-how much of the increase is actually used

#### 2. interest rate cap

-maximum rate it can earn

#### 3. spread, margin, administrative fee

-what the bank takes back first

### *Indexing Methods*

#### 1. annual reset (ratchet) method

-any increase from beginning to end of year

#### 2. point-to-point

-from contract date to contract date

#### 3. high water mark

-highest of increase at several points during the year

-some equity-linked are considered securities, fixed are not and variable are by the SEC

\***Office of Comptroller of the Currency, US Treasury OCC**- develops guidelines for annuities; Interagency statement says banks must disclose: not insured by FDIC, not a deposit or other obligation insured by institution, subject to investment risks; these risks must be disclosed orally and in writing at several points

-very strict guidelines for disclosure of annuity statements and such; separately with notices, though may still be on same statement as deposits

-may be audited under either the PCAOB or GAAS

## 5. Derivatives

-derive their value from other assets; good risk management tool, although subject to losses

### 2 Types

#### 1. option-type contracts

-buyers have the right, not obligation, to buy or sell at a specified price over a period; premium or price is a small % of underlying asset's value

#### 2. forward-type contracts

-specified amount of a commodity or financial instrument is delivered at a future date; no money exchanges hands until delivery

\***exchange traded**- more standardized contracts and greater liquidity

\***OTC**- more flexibility for individual needs; have higher credit risk and lower liquidity

-control weaknesses in derivative strategies: management not involved, lack of internal control, star manager syndrome, single counterparty, highly volatile or illiquid markets,

poor risk management systems, no risk or position limits, compensation based on performance, created reports, segregation of duties, no fiduciary mentality, suitable valuation models, reporting to management

### **7 Types of Risk**

1. market risk
2. market liquidity risk
3. counterparty risk
4. legal risk
5. systemic or 'interconnection' risk
6. operational risk
7. management risk

### **6. Electronic Services**

- either internet services provided by an institution, or moving money electronically
- \***automated clearing house ACH**- electronic collection and payment network banks use to move money; ACH receives, records, and facilitates debit and credit transactions between banks; includes direct deposit of employees, government and corporate payments, pension payments, dividends, direct debits, and corporate cash disbursements
- ACH allows entities to move funds to and from various locations quickly and easily; individual consumers can use it for debit payments from their accounts for bills; use of debit cards is also facilitated through ACH; just for US
- \***wire transfer systems**- immediate and irrevocable; throughout the world
- electronic banking has benefits and drawbacks, but mostly is good
- audits should focus on: internal controls in place to protect: customer transactions, information, and assets
- \***payment card industry PCI**- developed by Visa and MasterCard to develop security standards for credit cards

### **7. Cash Management Services**

- the electronic services typically enhance cash management services
- cash includes cash and cash equivalents (returned checks, unposted debits, t-bills)
- \***cash due from banks**- bank assets on deposit in correspondent banks that are used to collect checks; checks are sent to the due from bank; the due from bank either credits the due to bank's account or pays the due to bank directly with a bank draft
- due from bank balances are used to ensure liquid reserves, facilitate the transfer of funds, and to use as compensation for correspondent banking services
- banks will generate statements of cash flows to highlight their cash activities; most important area for auditors of banks and financial institutions
- accounts and receivable and payable must be examined to ensure payments are being made in the most timely manner; as in inventory control and lease/buy decisions

### **3 Primary Ways**

#### **1. sweep accounts**

- at the end of day, money in non-interest checking accounts is swept into short-term investment account overnight; at beginning of next day swept back into checking accounts

-larger banks buy their own commercial paper, and smaller banks use repo agreements to purchase securities in their own portfolio

## **2. lockboxes**

-banks pick up the checks from the firm's PO box; only good for large volumes of transactions

## **3. zero-balance accounts**

-when checks are presented for payment, money from interest bearing account is transferred in for payment

-auditor should: document systems, review reconciliations, confirm balances with 3<sup>rd</sup> parties, verify closure of accounts, verify deposits in transit recorded, review outstanding check list for unusual amounts and cancelled checks for unusual payees, confirm material cash funds held buy employees

## **8. Stocks**

### *Categories*

#### **1. common stock**

-authorized stock, issued stock, unissued stock, outstanding stock, treasury stock, par value, book value, market value

-rights: voting rights, proxy rights, preemptive rights, inspection rights, liquidation rights

-dividends: cash, stock dividend, stock split

#### **2. preferred stock**

types: cumulative preferred, non-cumulative preferred, participating preferred, convertible preferred, callable preferred

-costs more than preferred

#### **3. warrants**

-usually attached to a security, can be detached and sold separately, generally expire, exercise price for common stock

### *5 Types of Securities*

**1. Type I-** backed by full faith and credit of US government

**2. Type II-** includes obligation issued by a state or government agency for housing, university, or dormitory purposes not falling under Type I; include obligations of multinational organizations like World Bank and African Development Bank; banks can hold no more than 10% of their capital and surplus in 1 form of Type II

**3. Type III-** other investment securities not falling in other categories; corporate bonds and municipal bonds not falling under Type I

**4. Type IV-** small-business related, commercial-mortgage related, or residential mortgage-related securities; investment grade and fully secured

**5. Type V-** marketable investment grade securities not Type IV; fully secured by interests in a pool of loans to numerous obligors and national banks can invest in

## **4. options**

\***call-** right to buy

\***put-** right to sell

\***index options-** based on stock indexes; greater diversification

\***interest rate options-** speculate on direction of interest rates; limited market, futures

\***foreign currency options-** 24 hours a day, self regulated, and dominated by major banks and corporations

**\*Option Clearing Corporation**- standardizes rules for options; operates under jurisdictions of SEC and Commodities Futures Trading Commission CFTC  
 -handles options for SEC and futures for and options on futures as a Derivative Clearing Organization DCO for CFTC

-owned by 5 exchanges that trade options: AMEX, Chicago, International, Pacific, Philadelphia

-options are printed in newspapers and have 2 classes

**\*option class**- contracts of 1 type on an underlying security; all on IBM

**\*option series**- contracts of the same class with same strike price and expiration

-any contract followed by an r indicates an option that is not traded

### **5. trading securities**

-those a bank intends to sell within a month

-all securities must be in either an investment or trading account immediately

-usually record on trade date, but could be on settlement date if they are similar

-record at market value with unrealized losses or gains; when transferring to investment account, resulting loss or gain is trading income

-can record income as interest or trading, but only if not material; include in notes

### **6. securities available for resale**

-classify as current assets; if long-term, should be in investment account

-report at current market value, unrealized gains or losses are carried forward and adjusted with fair market value

-unrealized gains or losses are reported as separate component of stockholder's equity

-look at: correct recording, policies being followed, investments are good ones, transactions, diversification

## **9. Bonds**

-long-term debt includes notes and bonds; notes are issued to single investors

-discount when market rate exceeds stated and premium when market is lower

### **Categories**

#### **1. debt securities**

-bond, bearer bonds, coupon bonds, registered bonds, book-entry bonds (computers, used today), callable bonds, puttable bonds

**\*nominal yield**- coupon rate; stated on bond

**\*current yield**- based on current price of bond; higher than coupon if discount, and lower than coupon if premium

**\*yield to maturity**- return if the bond is held to maturity; if at par, equals nominal yield; when discount receive difference, when premium lose difference; as bond reaches maturity, YTM equals the par value

#### **2. corporate debt**

-bond certificate, trust indenture, secured bonds (1<sup>st</sup>, 2<sup>nd</sup> mortgage, and collateral), unsecured (debentures,, subordinated debentures)

#### **3. US government debt**

**\*negotiable securities**- traded continuously and very liquid and safe; exempt from state and local taxes; T-bills, T-notes (1,000 -100,000), T-bonds (1,000 – 1,000,000), T-receipts (interest stripped off separately)

**\*non-negotiable securities-** are not transferable and can be redeemed only by purchaser;  
 -series EE (50% face value, 50-10,000; maturity varies on interest rate and can be redeemed after 6 months; gains treated as ordinary income and can be deferred until redemption)

-series HH (par value with semiannual interest payments; EE must be used to purchase HH which mature in 20 years; can only be purchased at US Treasury or Federal Reserve)

#### **4. municipal debt**

-issued by state and local governments, US territories, schools, cities, and airports;  
 exempt from federal income tax

#### **5 Types**

1. general obligation- backed by faith
2. revenue- most common; backed by revenue streams
3. special tax- repayable from special taxes; cigarettes or liquor
4. double barreled- backed by 2 sources of revenue
5. moral obligation- backed by revenue, but if not sufficient might still pay

#### **5. money market debt**

-highly liquid with maturity less than 1 year  
 -include: repos, federal reserve requirements, commercial paper, negotiable CDs, money market funds

#### **5. Eurodollar debt**

-US currency in banks outside the US  
 -slightly higher than T-bills because of additional risk

#### **6. effect of interest rates on bond prices**

-inverse relationship between existing bond prices and interest rates

#### **7. bond ratings**

S&P or Moody's

-BA and BB and below are junk bonds; higher are investment grade  
 -MSRB, NABL, CIFA, IRS, and SEC provide information on bond audits  
 -to audit: policies, sufficient return, diversification of junk and investment, recording properly, and segregation of duties

#### **10. Commodities**

-any bulks of goods: grains, metals, foods, financial instruments (currencies)  
 -CFTC regulates the national Futures Association NFA that all must register with to trade or deal in futures

#### ***CFTC Examination Procedures for designated self-regulatory organizations DSRO***

1. all member futures commission merchants FCM are periodically reviewed by DSRO
2. each examination must be sufficient in scope
3. first phase is testing of records
4. areas selected for review must be in accordance with Joint Audit Committee JAC
5. in-field examination for most recent month-end
6. examination dates must vary
7. any violations must be acted upon
8. complete documentation of each examination is needed
9. scope of each examination may vary

## **11. Mutual Funds**

- pools of money with stated objectives
- often quoted as bid (net asset value) and ask (public offering price) prices
- can be sold back to fund minus any deferred sales loads or redemption fees

### ***4 Types***

#### **1. index funds**

- try to match the stocks of an index; either all of or a sample of
- more passive: less trading, better taxes, lower fees

#### **2. stock funds**

- invests in stocks; goes for a certain sector, growth or value

#### **3. bond funds**

- income funds; anything that gives a steady stream; any combination of
- risks include: credit risk, prepayment risk, interest rate risk

#### **4. money market funds**

- required by law to invest in highly liquid and low risk securities
- mutual funds can be either closed-end or open end; open end can issue infinite numbers of shares, but shares are not purchased on exchanges, rather from the fund itself or an agent
- all funds change their fees and all have a prospectus
- NASD says: distribution and marketing (12b-1) fees can't exceed .75% of average assets; and shareholder services fees can't exceed .25% of average assets
- must have a 12b-1 plan for distribution fees, but not for shareholder services fees; if not part of 12b-1, then shareholders service fees become 'other expenses'
- rest of the fees together with these can't exceed 2% of average assets
- mutual funds are subject to SEC and SEC acts of 1933 and 1934
- prospectus contains all pertinent information
- auditors: focus on recording of transactions; when brokers hold shares test these, and for proper accounting of fees and if deferred sales charges are deferred and amortized

## **12. Employee Benefits**

- fringe benefits, can pose risks for companies
- employee benefits are considered non-wage compensation designed to enhance monetary compensation
- payroll is the largest risk, including: paying employees no longer on payroll; unearned overtime, sick time or vacation time; improper salary increases; miscalculating social security or income tax deductions
- additional risks: failing to monitor employee benefit providers, and compliance with laws

### ***Types of Employee Benefits***

- insurance from employers to employees is group insurance; master group insurance contract with the group policy holder (the company); either non-contributory (employees don't pay premiums) or contributory (employees pay premiums)

#### **1. life insurance**

- most are yearly renewable and don't build cash values; similar restrictions and eligibility requirements

#### **2. health insurance**



- other family members are covered but there is only 1 plan issued; additional members can be added for a fee
- preexisting conditions may or may not be covered; can maintain if a switch occurs
- coordination of benefits COB to prevent double benefits; primary and secondary plan
- usually have conversion provisions to cover employees which lose or switch jobs until they get a new plan; usually must be paid for by employee
- consumer-driven health plan gives employees specified amount to pay bills; after that they have a high deductible to pay; better for companies but hurts low income workers; theory is employees will take better care of themselves when they have to pay more

### **3. accidental death and dismemberment**

- dies as result of accident or losses sight or limbs; low in cost and may not cover accidents at home

### **4. disability income**

- income replacement for those who can't work because of disability
- provides incentive to get back to work because it provides less income; % or fixed rate
- does not cover intentionally self-inflicted or caused by war or riot
- usually must be totally disabled; if can return in any capacity to some sort of job does not pay anymore

**\*presumptive disability provisions-** totally disabled if certain conditions, like blindness, speech or hearing loss occur; still receive full benefits even if return to work

- most have a waiting period to prevent payment for temporary disabilities
- most include doctor certifications and periodic reviews to ensure disability; insurer pays

### **5. dental**

- most are group; very few individual dental policies
- emphasize preventative care such as examinations and X-rays
- deductibles or co-pays exist for specific corrective procedures

### **6. worker's comp**

- each state has different worker's comp laws; claims must be filed with their state agency and notify their employer
- pays: medical expenses for injuries on job and diseases caught on job; disability income and rehabilitation for disabled through work; death benefits for survivors of employees who die from work injuries
- the company pays a deductible based on class ratings for the type of work; 100's of different classifications for each type of work and number of claims

**\*experience modification-** number of claims going up or down and premiums changing

### **7. employee stock option plan**

- allows employees to purchase stock at fixed prices for a given period of time
- SEC oversees because stock is bought and sold
- not retirement or stock ownership plans ESOP
- ESOP are when company contributes stock to the retirement plan; overseen by US Labour Department

### **8. profit sharing plan**

- based on the performance of the organization
- company can decide when and how much to contribute

### **9. pension plan**

- provide monthly benefits at retirement

- most are funded in part by employee contributions
- IRA is set up by individual; HR-10 (Keogh) are specifically for self-employed persons, and 401(K) allow employees to match employer contributions
- principle and interest in IRA, HR-10, or 401(K) are not taxed until funds are withdrawn
- ERISA regulates these; places restrictions on investments that can be used with the people's money
- individuals who administer qualified plans are fiduciaries; can be held liable
- must be a minimum time before benefits vest; vested employees get benefits even if fired
- employers receive tax benefits from having retirement plans
- any plan meeting the federal tax benefits qualifications is a qualified plan
- have a nondiscrimination component to prevent higher paid employees from getting more benefits

### **Administration of Group Insurance**

- may be administered through managed care plans that have specific doctors who can be seen
- have fee arrangements to encourage effective use of services by employees

#### **1. Health Maintenance Organization HMO**

- governed by HMO act of 1973 and serves 2 purposes; pay insured's medical expenses and provide a medical network known as HMO subscribers (doctors and hospitals)
- HMO's provide preventative and specialty care; doctors either get a fee or some get a salary from the HMO
- must choose a primary care physician; open panel can choose any doctor, but closed panel can only choose HMO specified doctors

#### **2. Preferred Provider Organization PPO**

- similar to HMOs
- either traditional PPO, where can choose any doctor, but reimburse at lower rate for these; fee for service basis
- or could be gatekeeper PPO, where they have to choose from specified list, and if go through their primary care there is a higher reimbursement rate; flat amounts (capitation rate)
- when 3<sup>rd</sup> parties administer the plans, these administrative-service-only contracts are not subject to state premium taxes
- insurance companies and managed plans use utilization management to ensure cost effectiveness

- \***utilization review**- specific process of reviewing the patient; begins with a preadmission certificate, where they have to contact the insurer to go to the hospital; if emergency must notify them within 48 hours or face reduced benefits
- utilization reviewers monitor costs while they are in the hospital; concurrent review
- then a retrospective review is done at the end; catch billing errors and excessive costs

### **13. Capital Market Products**

- capital markets include the stock and bond markets
- primary and secondary markets
- \***stock market**- stock trading; measured by stock indices

**\*bond (credit or debt) market-** collectively the individuals, governments, and private institutions that buy and sell bonds

**\*derivatives market-** market for derivatives; either exchange, Chicago or Euronext, or OTC

#### 14. Securities Lending

-lending securities

-return can be either on demand or at a specified date

-lender receives a fee and is protected by collateral

-title of both security and collateral changes hands

-borrower is entitled to economic benefits, still must make payments to lender

-International Securities Lending Association ISLA governs these

-securities lenders are usually big banks

-major reason is for short sales of stocks and bonds

-repurchase agreement- banks sell government securities to buy them back plus interest next day

-reverse repurchase agreement- purchaser of securities agrees to resell them to the lender at a price plus interest

-no transfer of funds; the Federal Reserve just credits and debits accounts

-any federal funds transactions exceeding 1 day is a loan

-auditors should: review counterparty creditworthiness, transaction limits, get physical custody of all collateral and mark it to market, list unprofitable transactions, reconcile books; ensure loans are separated, separate accounts for each loan,

#### 15. Insurance Policies

-insurance is a method of transferring risk for a fee

-insurance contracts are binding contracts

##### **4 Elements to a Binding Contract**

1. agreement

2. consideration

3. competent parties

4. legal purpose

-insurance policies include: definitions, agreement, declarations, exclusions

**\*unilateral-** insured decides whether or not to pay, not the insurance company

**\*aleatory-** pertaining to luck; payouts are unknown

**\*incontestable-** after 2 years no matter what; unless fraud occurred

-insurance contracts are considered contracts of adhesion in that require the insurer to pay covered events occur; they are liable for ambiguities in the contract

-use risk pooling to manage risk for individuals; actuaries get the exact rates

#### 16. Insurance Products

-not all individuals get group insurance, so they can purchase individual life insurance

##### **6 Types**

##### **1. whole life**

-lifetime coverage at a premium that does not change with age; accrue cash values

-can cash in at 65, but does not get full value until 99

\***continuous premium (straight life)**- payable until death; lower payments than limited

\***limited payment**- payable for a stated period, 20 years, or until death; whichever first

\***single premium**- require only 1 premium payment

\***modified premium whole life**- policy payments increase, every 5 years; allows young holders to purchase higher amounts of coverage

\***joint whole life (1<sup>st</sup> to die)**- death benefits paid to the survivor; survivor can purchase another whole life of same amount without proof of insurability

\***last survivor (2<sup>nd</sup> to die)**- pays only after both have dies; to pay estate taxes

## 2. term life

-temporary protection from 1 year to 40 years

\***level term**- benefits and premiums remain the same

\***decreasing term**- benefits decrease but premium remains level

\***increasing term**- benefits and premiums increase

\***convertible term**- can convert to permanent without proof of insurability; some insurers do not permit conversion after a certain age

\***renewable term**- can renew at end; premium usually increase

-attained age conversion uses the new age for new premium, and original age uses original age for permanent conversion

## 3. universal life

-permanent life with flexible premiums, face amounts, and separate pricing for 3 major categories: mortality charge based on classification, interest rate paid on cash value, expenses for administering policy

-purchasers of universal life specify face amount and whether death benefit will be level or vary as policy's cash value changes

\***level death benefit**- death benefit equals policy's face amount

\***variable death benefit**- death benefit equals policy's face amount plus accumulated cash value

-universal holders can choose how much to pay for initial and subsequent premiums

-maximum payment amounts and minimum amounts to maintain status as a contract

-policy remains in force as long as there is cash value to pay the premiums

-accumulate cash values that are tax deferred

## 4. endowment insurance

-provides a special benefit amount in either of 2 cases: insured survives to the maturity date of the policy; if the insured dies before the maturity date of the policy is reached

-policy dates may be set up either when the insured reaches a certain age or after a certain period of time has elapsed

-similar to whole (permanent) life in that premiums are usually level and the policies build cash values

-endowments build cash value more quickly; because the reserve and cash value of endowment policy usually equals the policy's face amount on the policy's maturity date, which is typically much shorter than a whole life

-whole life does not accrue a reserve and cash value equal to face amount until end of mortality table value, 99 or 100

## *Property and Casualty Products*

-protects individuals and businesses from financial loss

-worker's comp protects employers

**\*general liability policies-** provide additional insurance for businesses, lawsuits; does not protect for automobiles use, rolling fleet, or for property damage to the business

**\*completed, product, liability damage-** repair work and products sold

**\*medical payments liability-** injuries to public on business grounds

### **1. automobile insurance**

-do not cover damage that is intentionally inflicted; nor when there is unauthorized use by the person using it

**\*liability coverage-** pays other people hurt; also covers property damage; applies to autos mentioned in coverage and those used by the insured (rentals) and when other people drive it; not for regular business purposes

**\*medical coverage-** pays benefits to all passengers too, even if the insured was not legally responsible; benefits are limited

**\*auto coverage-** where the auto is stole, damaged, or destroyed; collision and other than collision insurance

**\*uninsured motorist coverage-** hit and run drivers; liability damage by uninsured motorists

-when crossing into states with higher liability, usually will cover it

### **2. homeowners insurance**

-combine property and casualty into same thing; multi-line policy

**\*property coverage-** dwelling, other buildings, personal property, loss of use

**\*casualty coverage-** personal liability, medical liability

-common exclusions include: intentional acts, negligence, flood, earthquake, war

-common inclusions: fire, lightning, hail, wind, explosion, riot, vandalism, theft, volcanoes

### **3. umbrella coverage**

-most extensive liability coverage for individuals and businesses

-covers for extreme damages, over 1 million; small personal retention will apply

-commercial umbrellas have a higher retention than personal, 10,000

## **17. Foreign Exchange**

-FOREX is international market where corporations and financial institutions buy and sell currency

-largest financial market in the world, and transactions are done with computers and phones

-can do it individually, but can use brokers to find more favourable rates

-foreign currency futures contracts can be traded on recognized futures exchanges or in the interbank market (large institutions)

### **2 Foreign Exchange Transactions**

#### **1. spot transactions**

-2 parties agree for immediate sale

#### **2. forward transactions**

-2 parties agree for a future date

**\*swap-** 2 parties exchange currencies for specified time and then reverse; most common

**\*option-** right to buy or sell at a future date

- factors influencing exchange rates: business cycles, balance of payments statistics, political developments, new tax laws, stock market news, inflationary expectations, international investment patterns, governmental and central bank policies
- audits include: internal controls for authorization, transactions properly valued and recorded, income and assets and liabilities properly recorded, electronic systems properly maintained

### **18. Asset Management**

- supervision of fund managers' portfolios and valuations
- asset is anything that provides value; something has asset value if it can provide future cash flows
- asset management refers to providing financial products or services to a 3<sup>rd</sup> party for a fee or commission
- asset management services include: personal trust and estate management, retirement plan services, brokerage services, investment company services
- current assets (net working capital) and long-term assets
- \***Asset/Liability Management ALM**- planning tool designed to maximize earnings
- must manage several risks: credit, liquidity, interest-rate, and capital risk
- must create specific risk/reward guidelines and use historical data to do so
- can also apply to managing fixed assets and intangible assets

### **19. Money Market Products**

- money market differs from capital market in that it is for 1 year or less
- banks use the money market to borrow and lend from other banks
- low risk and can be purchased at face value or at a discount

#### ***4 Main Types***

1. CDs
  2. commercial paper
  3. banker's acceptances- time draft drawn on and accepted by a bank; does not become liability until acceptance by the bearer of the draft
  4. repurchase agreements
- amortized cost of money market instruments usually equals their market value, unless the credit rating is severely reduced, then adjustments must be made

## III. Auditing Financial Services Processes

- 4 main areas of financial services: banking, insurance, investment management, operations
- includes: insurance, financial planning, banking, capital markets, investment banking
- ensure protection of company and customers through: asset management and protection, capital allocation management, financial risk analysis and management
- must also engage in fraud protection and anti—money laundering and regulations
- must provide fiduciary management while also striving for profits
- financial services is the largest industry in the world: 20%; deal with management and supply of money and financial instruments
- Gramm-Leach-Bliley Act 1990 deregulated much finance; allowed for easier integration of financial services

### **Global Reach**

- IFRS, IAS, and IASB
- different countries have different guidelines for using IFRS
- EU adopted IFRS in 2005
- UK uses the Financial Services Act FSA
- fastest growing industry in Scotland
- Russia is nascent
- Australia and New Zealand also comply
- Hong Kong GAAP is more restrictive than GAAP
- China- A companies only trade for Chinese; B companies and A financial use IFRS and trade openly
- US is going to IFRS
- \***EU savings directive**- requires all interest payments to EU to report these to their domestic authorities

### **1. Risk Management**

- \***risk assessment**- process of assessing the inherent risk associated with achieving business goals
- risks associated with operating objectives: business climate, competitors, technology, customer requirements, legislation, noncompliance with laws and regulations
- \***risk management**- assembling relevant information so management can make considered judgments about strategic decisions
- assesses qualitatively and quantitatively opportunities for success; must separate the methodologies and processes from the compliance function, which ensures they are being followed properly

- explores strategies to assess the firm's exposure to risk and minimize all risks
- an intelligent risk management platform uses technology
- must use enterprise-wide risk management and enterprise-wide intelligence management
- evaluating all risks together is the best approach

### **1. Asset/Liability Management**

- usually refers to firms that run mutual funds
- the largest are those that provide passive, ETF, or index funds

### **2. Trading Market Risk**

- market risk is changes in: interest rates, exchange rates, securities prices and derivatives
- trading market risk arises from changes in market rates, and their correlation and implied volatilities

### **Value at Risk VaR**

- primary mechanism of estimating potential losses; estimates the exposure to market risk within a given level of confidence over a defined time period
- VAR summarizes the predicted maximum loss (or worst loss) over a target horizon within a given confidence interval
- the level of loss we are X% confident will not be exceeded in some time period, T
- for the determination of bank capital, X is 1% and T is 10 days; thus if VaR is 5 million, there is less than a 1% chance that more than 5 million will be lost in next 10 trading days

### **4 Limitations**

1. changes in market rates may not tend to a normal distribution; vary large movements occur more frequently
2. correlations between market rate movements can vary; especially during periods of stress on the markets
3. changes in the PV are not perfectly linearly related to changes in market rates
4. use of a 1 day time horizon does not fully capture the market risk of positions that can't be liquidated in 1 day
5. models are based on past movements, and may not be indicative of the future

### **3 Common Misinterpretations**

1. VaR is based on assumption that the portfolio is held constant; in reality, active management reduces the % chance of loss
2. VaR is based on what happened in the past
3. VaR is not the largest loss that could occur; could be much greater or little greater, depending on the composition of the portfolio

### **2 Ways to Calculate**

- both are based on historical data and the assumption of a 1 day 1% 1 share portfolio

#### **1. historical simulation**

- get returns for 1 to 5 years, say 500 trading days; sorted from most negative to most positive; the 5 worst or 1% are separated, and applied to current stock price; the least negative of these is the VaR, since no more than 1% of all the losses reached or exceeded this level in the last 500 days

#### **2. model-based approach**

- use a model to get parameters from historical returns and predict future returns; then get mean, variance, and standard deviation, for the 1 percentile level

### **3. Credit, Liquidity, Operational Risk**

- firms must manage market, credit, operational, and liquidity risk



- \***credit, default risk**- determine amount of credit transactions to mitigate
- \***liquidity risk**- financial risk due to uncertain liquidity; credit rating falls
- \***operational risk**- failed personnel, internal processes, or external events

## **6 Market Risks**

### **1. interest rate risk**

- risk to earnings or capital from movements in interest rates
- arises from 4 risks
- \***basis risk**- changing rate relationships among different yield curves affecting bank activities
- \***repricing risk**- differences between the timing of rate changes and the timing of cash flows
- \***yield curve risk**- changing rate relationships across the spectrum of maturities
- \***options risk**- interest-related options embedded in bank products
- evaluation of interest rate risk must consider the impact of complex, illiquid hedging strategies or products, and also the potential impact on fee income that is sensitive to changes in interest rates; in situations where trading is separately managed, this refers to structural positions and not trading positions

### **2. price risk**

- risk to earnings or capital arising from changes in the value of portfolios of financial instruments
- arises from market dealing and making, position taking activities in interest rate, foreign exchange, equity, and commodities markets
- focuses on the changes in market factors (interest rates, market liquidity, volatilities) that affect the value of traded instruments
- rising interest rates reduce the value of warehouse loans and pipeline commitments, and cause market losses if not adequately hedged; falling rates cause people to seek more favourable loans, and withdraw loans before applications close; thus the bank may not be able to meet its forward sales commitments, and may have to purchase loans at higher prices or do a pair-off
- \***pair-off arrangement**- bank liquidates its commitment to sell and deliver mortgages by paying a fee

### **3. transaction risk**

- risk to earnings or capital arising from problems with a service or product delivery
- function of: internal controls, information systems, employee integrity, operating processes; exists in all products and services
- transaction risk increases if managing escrow accounts or custodian activities
- for a mortgage banking operation this involves originating, selling, and servicing large volumes of loans efficiently

### **4. compliance risk**

- risk to earnings or capital from violations or non-conformance with laws and regulations or ethical standards; or where these may be ambiguous
- exposes: fines, civil money penalties, payment of damages, and voiding of contracts
- can lead to: diminished reputation, reduced franchise value, limited business opportunities, lessened expansion potential, and lack of contract enforceability
- mortgage banking should not discriminately raise rates for certain customers

### **5. strategic risk**

- risk to earnings or capital arising from adverse business decisions or improper implementation of those decisions
- includes strategy, resources, and implementation
- can result from: changes in quality or quantity of services offered, operating controls, management supervision, hedging decisions, acquisitions, competition, and technology
- strategic decisions are always hard to reverse on short-term basis
- must understand economic dynamics and market conditions

#### **6.reputation risk**

- risk to earnings and capital arising from negative public opinion
- affects ability to establish new relationships or continue servicing existing ones

#### **4. Allowance for Loan and Lease Losses**

- reserve for bad debts; valuation reserve established and maintained by charges against the bank's operating income
- as a valuation reserve, it is an estimate of uncollectible amounts that is used to reduce the book value of loans and leases to the amount that is expected to be collected
- few banks did this until the IRS required it in 1965
- banks could make tax-deductible additions to their loan loss reserve up to 2.4% of eligible outstanding loans; in 1969 the OCC issued a provision requiring provisions for possible loans to be included in operating expenses; minimum amount could not be less than amount computed under any of 3 methods, being consistent
- under 1969 regulation, bank's loan loss reserve consisted of 3 elements: valuation portion, contingency portion, deferred tax portion
- now: valuation portion is reported as a deduction from total loans; deferred tax portion is included with other liabilities; contingency portion is included with the equity capital section of the balance sheet
- when a bank charges off a loan as a loss, it reduces its loans (credit) and reduces contra-asset account called 'allowance for loan and lease losses' (debit); the bank increases 'allowance for loan and lease losses' (credit) with a debit to expense account 'provision for loan and lease losses'
- nonperforming accounts are not yet losses
- \***coverage ratio**- adequacy of the bank's allowance to absorb future loan losses; allowance/nonperforming loans
- capacity of banks to absorb losses also depends on the amount of equity these banks hold
- allowance is not a cushion against future losses, capital is that; just an estimate; general reserve for all loans
- government rules and not theory determines ALLL for financial institutions;
- different impairment methodologies and groupings

#### **5. Reserves**

- savings or funds set aside to finance future spending pressures and known contingencies
- must keep some in the central bank and some in their own bank
- Bank of England uses 'rest' to describe reserves

#### **Industries**

##### **1. Insurance**

- reserves for each type of cases; reserves deficiencies and reserves redundancy; reserves statutory and reserves ultimate

-many different categories; also reserves for claims and other liabilities

## **2. Banking**

-equals vault cash plus reserve account

## **3. International Economics**

-assets held in foreign currency plus gold for intervening in the markets; also SDR's

## **4. Managed Health Care**

-just monies for anticipated claims and operating expenses; % method

### ***International Financial Reporting Standard and Reserves***

-reserves, together with share capital and equity instruments, make up the SE section

-reserves are specifically defined in IFRS, but are not a provision either

-reserves include: fair value, hedging, asset revaluation, foreign currency translation reserves and RE

-these reserves result from fair value and foreign currency translation adjustments, required by IFRS to be in equity rather than income

-reserves are not re-measured, but may be restated when entity is reporting in currency of a hyperinflationary economy

### **1. fair value reserve**

-unrealized gains/losses (net of tax) on investments classified as available-for-sale may be recognized in equity (within a fair value reserve) or in the income statement; these gains/losses are recycled to the income statement on disposal or impairment

### **2. hedging reserve**

-IFRS requires gains/losses (net of tax) from revaluing of cash flow hedges be deferred in separate equity section

-they are eventually transferred to income statement in the periods where the hedged item affects the income statement; or when they cease to be effective

-hedging gains/losses relating to forecast transactions are transferred from reserves and incorporated into the initial measurement of the hedged item

### **3. asset revaluation reserve**

-subsequent to initial recognition, PPE may be revalued to fair value; surplus or decrement must be recognized in equity

-the surplus is transferred to RE periodically net of taxes; amount realized is difference between depreciation of revalued amount and original cost

-when the asset is sold or scrapped, the surplus is transferred directly to RE as a realized gain and does not pass through the income statement

### **4. foreign currency translation reserve**

-foreign translation differences from subsidiaries should be recognized in equity

-translation adjustments must be tracked separately in equity; upon disposal, the cumulative translation difference relating to the entity is transferred to the income statement and included in the gain or loss on the sale

## **2. Underwriting**

-process by which investment bankers raise capital through debt and equity on behalf of entities, or the process of purchasing new issues from issuer and offering them for sale

-underwriters provide price guarantees and also provide insurance and re-insurance

-the commission is built into the price, included in the prospectus; the primary or wholesale market is where the IPO's are sold

**1. Loans**

- loan file is submitted and then loan officer underwrites it and renders a decision
- type of information sought depends on type of loan
- income and debt ratios; employment history; credit history; savings; appraisal
- render: approved, denied, suspended

**2. Securities**

- contrasted with the retail part, which is the primary market
- tradable interest representing financial value that have a certificate
- all securities are registered with SEC, although not all may trade on markets; NASD and other markets regulates heavily as well
- very exhaustive definition of a security; includes all warrants, options, stock, and bonds

**3. Insurance**

- many claims recently by officers and directors of financial institutions because insurance companies have not fully understood what they were insuring
- used to just be simple phone calls placed; now there are detailed meetings for D&O insurance
- new experts have been brought in to aid in the underwriting process

**4. Private Placement**

- usually more restrictions, but are not governed by the SEC
- happens with munis as well
- Regulation D allows for private placements without regulation for: small firms, for quicker funding, easier purchasing
- still some disclosure and requirements even if between 2 people, but much less than for public offerings

**5. IPOs**

- for new companies; equity or debt
- used to be investment banks to compete for the best IPO's
- usually have 2 underwriters; to ensure quality disbursement and for adequate research so 1 house doesn't inflate the price
- Canada has dual oversight: provincial and federal

**3. Securitization**

- process of raising funds through the sale of securities
- creates a new financial instrument representing an undivided interest in a segregated pool of assets such as commercial mortgages; ownership of the asset is usually transferred to a legal trust or special purpose, bankruptcy-remote corporation to protect the interest of the security holders
- subprime lenders will increase loans and securitize and sell their loans in asset-backed securities
- this carries many risks however: credit and liquidity; moreover, substituting performing loans for nonperforming will have the effect of masking issues
- if markets turn these pools of subprime mortgages will have to be sold at deep discounts; contingency plans are a must for these organizations
- if securitization meets FAS 125 criteria, the seller must recognize loss/gain on the sale of the pool immediately and carry any RE in the assets sold (servicing rights/obligations or interest-only strips) at fair value

-consider: discount rates, credit loss rates, prepayment rates for subprime pools for valuing these assets

-separate them into various pools as well for characteristics

### ***Securitization Process***

#### **1. production-origination-underwriting**

**2. mortgages-** underlying collateral for CMBS; price at worst case scenario

**3. underwriting-** group the mortgages into pools; region, people, type

#### **4. accumulation-warehouse-aggregation**

**5. structuring-** experiment with different classes for best prices

**6. credit enhancement-** to reduce risk for the insurer

#### **7. closing**

**8. collateral pool-** final pool owned by the trustee

**9. distribution-** to trustees and then to individuals

**10. trustee-** holds collateral for all tranches (classes of owners) of certificates

**11. master servicer-** services the mortgage loans

**12. special servicer-** services when in default

**13. sub-servicer/primary servicer-** subcontractor

**14. securities instrument servicing-** actual certificates held by Depository Trust Company

**15. securities administration-** master servicer collects the money to the account

**16. securities-** the actual ownership interests

**17. investors-** mainly insurance companies; real estate companies for high risks

**18. trading-** higher the credit rating the more trading occurs

### **4. Treasury Operations**

-cash management

-SOX gave treasurers more power and ability to make changes

-treasury best practices now include 2 new attestation functions by senior management

### **5. Back-office Operations**

-refers to the offsite delivery of a range of non-core service functions, including routine administration tasks, customer service, and technical support

-manage operations on a turnkey basis for customers

-many of these services are outsourced, and many use the internet for technical support as a result of business process outsourcing

-originally many of these were cost centres, but have turned into profit centres because of 3<sup>rd</sup> parties and external clients

-today back-office includes: administration, finance, HR and payment services

-any sort of non-core business really

### **6. Marketing Sales and Distributions**

-insurance agencies, bank branches, brokers

-marketing is the process of identifying customers and developing products and processes to meet their needs

-sales is the process of agents addressing potential customers and writing applications for new policies

- insurance companies are authorized or admitted if it holds a valid certificate of authority from their state; otherwise, they are unauthorized
- agents are representatives to sell insurance; captive or exclusive agents sell for 1 company, while independent sell for multiple companies
- field force is the company's offices and detached office is a private office
- insurance brokers work for insureds and not a company; they find the best possible insurance
- illegal sales practices: misrepresentation, twisting for new policies, rebate for a new policy
- 2 distribution systems: personal selling (face to face), uses ordinary or multiple line; direct response is telemarketing with the actual company

### **7. Claims**

- the claims function is concerned with ensuring that claims are paid promptly and correctly to the claimant (insured or beneficiaries)
- claims specialists review this information
- insured must file the claim within a period of time, and additional evidence or investigation may be needed; appraisals, arbitration

### **8. Investments**

- insurance has become attractive as an investment because of universal and whole life
- insurance is less risky and has bonuses and tax benefits, but you must pay a premium every month
- but the amount invested as premium comes back with added returns
- should not be considered for investment however: commissions are built in, and cash value is only 1-3% of investment
- tax implications: whole life cash surrender value is fully taxable; 401K can take out chunks and keep majority tax deferred
- life insurance does not accumulate fast enough because of high commissions; its power is from death benefit (not taxed) and estate planning
- whole life can borrow easier whenever there is a cash value directly from insurance company for bank like interest rate
- mutual companies pay lower dividends while policy loans are outstanding (direct recognition); stock-held companies do not do this
- premiums don't have to be paid for the life of the policy; excess dividends can pay premiums; not subject to liability or creditors
- the estate bond can provide tax free legacy for heirs

### **9. Broker-dealer Activities**

- investment banking is the first step in the underwriting process
- evolved as most efficient means: middleman specialty

#### ***Types of Offerings***

- investment banker usually purchase the securities outright
1. firm commitment- sell all the securities
  2. standby commitment- sell any securities the issuer can't sell
  3. best-efforts commitment- for speculative securities; commission based

### ***Legislation Affecting Broker-dealer Function***

#### **1. SEC 1933**

- requires new offerings to be registered with SEC; materiality and completeness
- empowers investors through disclosure

#### **2. SEC 1934**

- more comprehensive and extended to trading in already issued securities
- requires broker-dealers to register with SEC and SRO and regulates them

#### **3. Trust Indenture Act 1939**

- gives additional protection to investors of new debt and securities; indentures

#### **4. Investment Company Act 1940**

- regulates primarily companies investing in securities of other companies; mutual funds

#### **5. Private Securities Litigation Reform Act**

- PSLRA; to stop excessive litigation from lawyers to extract suits against issuers and others; made it harder to bring a lawsuit, before many companies would just settle to avoid costs

#### **6. Securities Litigation Uniform Standards Act**

- SLUSA; extension of PSLRA for state courts; now all lawsuits have to go to federal courts

#### **7. National Securities Markets Improvements Act**

- NSMIA; clearly defined responsibilities of SEC and state governments for regulating securities and brokers and dealers

#### **8. Glass-Steagall Act**

- 4 sections of the Banking Act of 1933; restricted commercial and investment banking activities due to the Great Depression

#### **9. Regulation A**

- allows the filing of a limited registration statement; not more than 1,500,000 in the previous year and offerings by a person affiliated with the issuer can't exceed 100,000

#### **10. Regulation D**

- SEC rules 504-506; private placements

#### **11. SEC Rule 504**

- no information disclosure; can't be an investment company; up to 500,000

#### **12. SEC Rule 505**

- no information disclosure; can't be an investment company or Regulation A; 5 million to 35 investors

#### **13. Sec Rule 506**

- any issuer to 35 accredited or any non-accredited for any amount

#### **14. Sec Rule 10(b)-6**

- syndicates of investment bankers

#### **15. Regulation T- Credit by Brokers and Dealers**

- regulates credit for margin and short sales

#### ***Key Risks***

1. management authorization
2. insider trading

#### **Broker-dealer Sales Desk**

- sales desks are either: retail or institutional

-retail operate out of branches and serve individuals; institutional operate out of headquarters and serve pension funds, mutual funds and other high end clients

### ***Risks***

1. strategic plan and objectives
2. policies and procedures
3. management supervision
4. marketing tactics
5. customer suitability

### ***Order Processing Transactions***

-2 types of transactions

1. principal transactions- broker sells to client from personal stash
2. agency transactions-broker is the middleman with the client and institution

### ***Purchase and sales P&S department***

-4 functions

1. recording- CUSIP numbers for each transaction
2. figuration- exact commissions and such
3. comparison- separate by exchange to see what deal is got
4. booking- manual booking involves trade corrections

### ***Continuous Net Settlement CNS***

-operated by NSCC was developed for complete automation of processing securities transactions

-has completely centralized and automated everything

## **10. Rating Advisory Service**

-because of Basel II, banks are more<sup>3</sup> reluctant to grant loans

-strict rules apply especially in international markets that only allow institutional investors to invest in officially rated notes and bonds

-smaller companies can still acquire debt with syndicated loans and note loans, but debt is the best bet; external rating is key

-ratings also have a good image building effect and expanded funding base

-banks will not divulge this information after rating purposes

-long-term ratings include: default risk, operational risk; degree of certainty of interest and principal payments against long-term obligation

-companies with R&D and PPE may have less cash but better future growth potential

### ***Key Financial Indicators Considered Rating Assessments***

1. ROA
2. ROBA-  $\text{business assets} / \text{E(P)BIT} / \text{working capital} + \text{fixed assets (business assets)}$
3. net debt ratio- solvency or gearing ratios; highly geared; gross or net debt
4. ratio of debt to operating cash flow
5. interest coverage ratio

## **11. Mergers and Acquisitions**

-gaining ground again but not as much as the 1990's

### ***M&A***

1. acquirers usually pay too much
2. friendly deals done using stock often perform well



3. CEO's fall in love and don't walk away
4. integration is hard to do, but some do

### ***5 Reasons Acquisitions Occur***

1. to deal with overcapacity through consolidation in mature industries
2. to roll up competitors in geographically fragmented industries
3. to extend new products to new markets
4. as a substitute for R&D
5. to exploit eroding industry boundaries by investing an industry

## **12. Loan Operations**

-collateral issues, perfecting liens

\***collateral**- the property subject to a lien; first in time, first in right

\***International Swaps and Derivatives Association ISDA**- global trade association representing participants in the privately negotiated derivatives industry; covers swaps and options across all asset classes (interest rate, currency, commodity, energy, credit, and equity)

-chartered in 1985 and includes 600 institutions from 46 countries

-developed the ISDA master agreement to govern these exchanges; and the ISDA collateral guidelines

-collateralization is part of the risk management toolkit: credit analysis, capital reserving, netting, selective termination, credit derivatives

-collateralization improves the recovery rate in case of default and thus decreases the possible loss; can therefore improve deal pricing

-introduces other risks as well, such as legal and operational; very much a cross-functional role across the whole company

-margin calls efficiency and collateral selection has improved; must consider: price volatility, liquidity, and credit quality of the assets

-proper valuation is integral as well; automation is increasing, so standards for financial language is necessary; financial products mark-up language FPML and related EDI

-a tax depository is required to hold collateral with the local Federal Reserve Bank equal to the depository's main account balance to ensure that the Treasury's Funds are secured

-pledged collateral consists of: book-entry, definitive (physical documents), 3<sup>rd</sup>/4<sup>th</sup> party

### ***Systems to Assist in Tax Collection and Investment Processes for Firms and Treasury***

#### **1. Treasury Investment Program TIP**

-invests excess Treasury funds for federal tax payments and other unused payments in participating financial institutions; charged interest for use and return them whenever the Treasury needs them

-gets the funds through 1 of 3 payment systems; this information is stored in TIP and used for record keeping and forecasting needs for the Treasury

### ***3 Electronic Tax Payment Mechanisms***

#### **1. Electronic Federal Tax Payment System EFTPS**

-specifically designed to interface with Treasury Tax and Loan TT&L for federal income tax payments for banks for clients/customers

-can either use future day or same day mechanisms

**\*future day payments:** ACH debit (customer's account) or credit (bank's account); either way the institution receives a credit to its account on the settlement date, and non-TT&L or collector institutions receive debits on settlement date

-for reporting 1 day in advance

**\*same day payments:** Fedwire value (immediately, Treasury gets debited) or non-value (end of day, collector gets debited)

-when taxpayers can't report 1 day in advance

## **2. Paper Tax System PATAX**

-used to collect, adjust, and report all paper-based federal tax deposits FTD

-steps: upon receipt of FTD, financial institution enters its advices of credit AOC via Fedline or PATAX voice system; then PATAX processes and transmits information to TIP; TIP collects the funds, credits the financial institution, and transmits info to IRS

-PATAX also processes adjustment requests from financial institutions and the IRS for paper tax payments and monitors the collateral pledged for in-transit balances

## **3. Federal Reserve Electronic Tax Application FR-ETA**

-nothing in the book

**\*counterparty risk management-** use of master agreements has greatly helped this

-day to day declines in derivatives expose the firm to more collateral; low credit ratings will cause the firm to need more collateral

### ***Key Collateral Issues***

#### **1. federal agencies securities market**

-government sponsored agency debt is outstanding

#### **2. mortgage-backed securities**

-MBS are debt obligations that represent claims to cash flows from pools of mortgage loans, usually with residential property

-most are issued by FreddieMac and FannieMae; but some private-label ones exist as well

-most are pass-through participation certificates, which entitle the holder to a pro-rate share of all principle and interest payments made on the pool of loan assets

-some are collateralized mortgage obligations or mortgage derivatives, which hedge risk

-prepayments of mortgages renders these meaningless

#### **3. valuation date and valuation time**

-refers not only to aggregation of value of exposure-bearing trades but also to the mitigating collateral positions and movements and the agreement terms and conditions

#### **4. valuation agent**

-institution responsible for publication of credit agreements

#### **5. rehypothecation**

-margin loan; reuse of posted collateral

-hypothecation is the use of collateral

-not permitted many places

#### **6. repurchase agreements repos**

-sell and buyback; most are overnight transactions

-the party who purchases and later resells is doing a reverse repo

### ***2 Reasons for Reverse Repo***

1. short-term investment- general collateral GC

2. obtain temporary use of security- special security

- interest rates for special repos are less than general collaterals
- secured loans, credit doesn't matter

# Accounting

- I. Financial Accounting**
- II. Management Accounting**
- III. Regulation**
- IV. Taxation**

## **I. Financial Accounting**

### **I. Ratio Analysis**

### **II. IFRS**

1. Financial Accounting Standards and Statements
2. The IAS Financial Statements
3. Accrual Accounting
4. The Accounting Cycle
5. Revenue Recognition
6. Interim Financial Reporting
7. Financial Accounting of Assets
8. Marketable Securities Management
9. Property, Plant and Equipment
10. Financial Accounting of Liabilities and Equity
11. Bonds
12. Financial Statement Analysis
13. Basic EPS
14. Diluted EPS
15. Financial Structure
16. Long Term Financing
17. Capital Structure
18. Capital Structure Decisions
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23. Leases
24. Sale-Leaseback Transaction
25. Employee Benefits
26. Accounting for Income Taxes
27. Accounting Changes
28. Accounting for Foreign Operations
29. Financial Instruments

### **III. US GAAP**

#### **I. Concepts and Standards for Financial Statements**

1. Concepts and Standards for Financial Statements

#### **II. Typical Items:**

1. Receivables and Bad Debt Expense
2. Inventory
3. Cash, Cash Equivalents, and Marketable Securities
4. PP&E; Intangible Assets; R&D
5. TVM
6. Liabilities
7. Notes and Bonds Payable

#### **III. Specific Transactions**

1. Equity Accounts; EPS; Stock Options
2. Presentation and Disclosure in Financial Statements
3. Consolidated and Combined Financial Statements and the Equity Method
4. Financial Statement Analysis
5. Revenue Recognition
6. Miscellaneous Topics
7. Financial Instrument
8. Foreign Currency Transactions and Translation
9. Accounting for Income Taxes
10. Leases

#### **IV. Governmental Entities**

1. Governmental Accounting

#### **V. Governmental not-for-profit**

1. Not-for-Profit Accounting

### **IV. Canada/SA/UK/Australia GAAP**

## **II. Management Accounting**

1. Costing Concepts
2. COGS/COGM
3. Manufacturing Overhead Allocation
4. Process of Accounting for Factory Overhead
5. Operation Costing
6. Service Cost Allocation
7. Joint Products
8. By-Products
9. Variable and Absorption Costing
10. Variance Analysis
11. Capital Budgeting
12. Present Value and Future Value of Money
13. Capital Budgeting Methods
14. Discounted Cash Flow Methods
15. Capital Rationing in Capital Budgeting

16. Budgeting
17. Transfer Pricing
18. Relevant Information for Decision-Making
19. Marginal Analysis
20. Cost-Volume-Profit (CVP) Analysis
21. Breakeven Analysis when More than 1 Product is Sold
22. CVP and Conditions of Risk and Uncertainty
23. Responsibility Centres and Responsibility Accounting

### **III. Regulation**

#### **I. Business Law Ethics and Professional Responsibilities**

1. Contracts
2. Sales
3. Secured Transactions
4. Negotiable Instruments
5. Documents of Title
6. Agency
7. Bankruptcy
8. Surety and Debt Collections Remedies
9. Property
10. Insurance
11. Securities Acts and Antitrust Regulations
12. Regulation of Employment
13. Accountant's Legal Liability
14. Professional Responsibility

#### **II. Government Legislation**

1. Government Regulations
2. Government and the Economy
3. Monetary Policy
4. Money Supply
5. Fiscal Policy
6. Government Funding
7. International Business Law
8. Forms of Business Organization
9. Contract Law
10. Legal Evidence

#### **III. Laws/Regulations and Regulatory Environment**

##### **I. US**

1. Overview of the Regulatory Environment
2. Laws and Regulations
3. Stock Exchanges and Other Markets

## **II. Canada/SA/UK/ Australia**

1. Overview of the Regulatory Environment
2. Laws and Regulations
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## **IV. Taxation**

### **I. Federal Tax Procedures and Accounting Issues**

Filing Status and Exemptions, Filing Requirements and Penalties

Accounting Methods & Periods, and Computations of Tax Liability & Tax Credits

### **II. Federal Taxation of Property Transactions**

Taxation of Gifts, Estates and Fiduciaries, and Exempt Organizations

### **III. Federal Taxation- Individuals**

Income- Inclusions and Exclusions

Deductions for Adjusted Gross Income

Deductions from Adjusted Gross Income\

### **IV. Federal Taxation- Entities**

Capital Transactions

Partnerships

C Corporations

Distributions, S Corporations and Other Corporate Matters

Corporate Distributions and Other Matters

S Corporations

### **V. State Taxation**



# Financial Accounting

## I. Ratio Analysis

## II. IFRS

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4. The Accounting Cycle
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# I. Ratio Analysis

## Short term liquidity

-working capital- current assets – current liabilities

**Current ratio**= current assets/ current liabilities

**Quick ratio (acid test)**= (cash + net receivables + marketable securities)/ current liabilities

**Cash ratio**= cash + marketable securities/ current liabilities

**Cash to current assets ratio**= cash + marketable securities/ current assets

**Cash flow ratio**= cash flows from operating activities/ current liabilities

## Inventory and Receivables Management Ratios

**Operating cycle**= inventory + receivables

**Cash flow cycle**= inventory + receivables – payables

**Inventory turnover ratio**= COGS/ average annual inventory

**Receivables turnover** = net credit sales/ avg. accounts receivable

**Average collection period**= 365/ receivables turnover (inventory turnover)

**Trend over time**= provision for doubtful accounts/ gross accounts receivable

**Purchases**= cost of sales + EI - BI

**Days of sales in inventory**= avg. inventory/ avg. cost of sales per day

**COGS**- BI + purchases - EI

## Others

-low liquidity index is good, high liquidity- number of days required to convert current assets to cash

\***capital structure**- how a firm chooses to finance its business

\***solvency**- the ability of a company to pay their long-term obligations as they come true

**Financial leverage ratio, equity multiplier**- avg. total assets/ avg. total equity

-financial leverage index greater than 1 is good

-**ROE**= net income – interest and taxes/ avg. total common equity

-**ROA**= net income/ avg. total assets

## Capital Structure and Solvency Ratios

**DFL**= EBIT/ earnings before taxes

**DOL**= CM/ Operating income (EBIT)

**Total debt to total capital**= total liabilities/ total assets

**Total debt to equity capital**= total liabilities/ total equity

**Equity capital to total debt**= total equity/ total liabilities

**Debt-equity ratio**= long-term liabilities/ total equity

**Asset Coverage Ratios**

**Fixed assets to equity capital**= net fixed assets/ total equity

**Net-tangible assets to long-term debt**= total assets- intangible assets- total liabilities/ long-term debt

**Total liabilities to net tangible assets**= total liabilities/ total assets – intangible assets – total liabilities

**Earnings Coverage Ratios**

**Times interest earned**= EBIT/ interest expense

**Earnings to fixed charges**= EBIT + interest applicable to long-term operating leases/ interest expense + interest applicable to long-term operating leases

**Cash flow to fixed charges**= pre-tax operating cash flows + EBIT + interest applicable to long-term operating leases/ interest expense + interest applicable to long-term operating leases

**Return on Invested Capital**

**Return on invested capital**= net income/ avg. invested capital

**Return on invested capital**= net income + interest expense(1-tax rate) + minority interest in income/ avg. total assets

**Return on invested capital**= net income + interest expense(1-tax rate) + minority interest in income / avg. long-term debt + avg. equity

**Return on invested capital**= net income – preferred dividends/ avg. common shareholder's equity

**Dupont Equation**

- end of year values not averages

**Profit margin on sales, return on sales, net income ratio**= net income after interest and taxes/ net sales

**-ROA**= profit margin on sales \* asset turnover ratio

-net income /total assets

**-ROE**= profit margin on sales \* asset turnover ratio \* equity multiplier

**-ROCE**= net income after taxes and interest – preferred dividends/ common equity

**-ROCE**= adjusted profit margin \* asset turnover ratio \* equity multiplier

**Equity growth rate**= net income – preferred dividends – dividend payout/ avg. common stockholder's equity

**Sustainable equity growth rate**= ROCE \* (1 – dividend payout ratio)

**Dividend payout ratio**= cash dividends per common share/ earnings per share

**Return on shareholder's investment**= cash dividends per share + market value of reinvested earnings/ share price

**Affecting probability**= estimates, accounting methods, incentives for disclosure, diversity among users

-source, stability, and trend of revenue

**\*earnings persistence**= a measure of the constancy of earnings over time

\***effective tax rate**= income tax expense/ income from continuing operations before taxes

### Probability Ratios

\***gross profit margin**= net sales – COGS/ net sales

\***book value per share**= stockholder's equity/ # of shares outstanding

\***operating cash flow to income**= cash flow from operating activities/ net income

**Earnings quality**= company's business environment, selection and application of accounting principles, character of management

**Earnings persistence**= earnings variability, earnings trend, management incentives, earnings, management

### Other Ratios

\***price/book ratio**= market price per share/ book value per share

\***PE ratio**= market price per share/ diluted earnings per share

### EPS

\***Income available to common shareholder's (IAC)**= NI- non-cumulative preferred dividends declared – cumulative preferred dividends earned= IAC

\***weighted average number of common shares outstanding(WANSCO)**= average shares

\***basic EPS**= IAC/WANSCO

\***earnings yield**=diluted earnings per share (annual)/ current market price per share

\***dividend yield**= annual dividends per common share/ current market price per share

\***dividend payout ratio**= annual dividend per share/ diluted earnings per share

\***vertical common size financial statement analysis**- compare the performance of different sized companies over a period of time

\***horizontal trend analysis**- comparison of data for a single company or single industry over time

\***current cost accounting**- physical capital maintenance, replacement of capacity used

\***constant dollar or general price level accounting**- financial capital maintenance; general price level index

## II. IFRS

### **1. Financial Accounting Standards and Statements**

1. Basic Concepts of Financial Accounting
2. The International Accounting Standards Committee
3. The International Accounting Standards Board
4. Objectives of Accounting Information
5. Qualitative Characteristics of Accounting Information
6. Elements to the Financial Statements
7. Recognition of Financial Statement Elements
8. Measurement Attributes of Assets and Liabilities

### **2. The IAS Financial Statements**

1. The Balance Sheet
2. Statement of Income
3. Cost of Goods Sold
4. Classification of Expenses
5. Statement of Changes in Equity
6. The Statement of Cash Flows

### **3. Accrual Accounting**

### **4. The Accounting Cycle**

### **5. Revenue Recognition**

1. Instalment Method of Profit Recognition
2. Cost Recovery Method of Profit Recognition

### **6. Interim Financial Reporting**

### **7. Financial Accounting of Assets**

1. Cash Management
2. The Operating Cycle
3. The Cash Budget

### **8. Marketable Securities Management**

1. Cash and Marketable Security Management Models
2. Receivables
3. Accounting for Cash Discounts
4. Determining the Amount to be Received and Valuing the Receivables
5. Writing off a Receivable When it Becomes Uncollectible
6. Collecting Previously Written-Off Receivables
7. Notes Receivable
8. Inventory
9. Lower of Cost or Net Realizable Value

### **9. Property, Plant and Equipment**

1. Measurement at Acquisition
2. Depreciation
3. Subsequent Expenditures
4. Intangible Assets

### **10. Financial Accounting of Liabilities and Equity**

1. Current Liabilities
2. Accounts Payable A/P
3. Notes Payables N/P
4. Other Determinable Liabilities
5. Estimated Liabilities
6. Premiums or Coupons
7. Compensated Absences and Post-Employment Benefits
8. Contingent Liabilities
9. Long-Term Liabilities

### **11. Bonds**

1. Issuance of the Bonds- Calculating the Selling Price
2. Recording the Sale of the Bond in the Books
3. Amortizing the Premium or Discount
4. Straight-Line Amortization of Bond Premium or Discount
5. Equity
6. Preferred Stock
7. Dividend Decisions
8. Retained Earnings
9. Statement of Retained Earnings

### **12. Financial Statement Analysis**

1. Liquidity (Solvency) Ratios
2. Asset Management Ratios
3. Leverage (Solvency) Ratios
4. Profitability Ratios
5. Growth Ratios
6. Earnings per Share

### **13. Basic EPS**

1. The Impact of Dividends on IAC

### **14. Diluted EPS**

1. Valuation Ratios

### **15. Financial Structure**

1. Short-Term Financing
2. Trade Credit
3. Other Sources of Financing
4. Intermediate-Term Financing

### **16. Long Term Financing**

1. Debt-Bonds
2. The Selling Price
3. Characteristics of Bonds
4. Types of Bonds

### **17. Capital Structure**

1. Cost of Capital
2. Weighted Average Cost of Capital (WACC)
3. Cost of Debt
4. Cost of Common Equity

### **18. Capital Structure Decisions**

1. The Marginal Cost of Capital

### **19. Risk Management**

1. Risk
2. Types of Risk
3. Portfolio Risk
4. Portfolio Management
5. Risk Management Tools

### **20. Leverage**

1. Operating Leverage
2. Financial Leverage
3. Total Leverage

### **21. Accounting for Investments**

### **22. Business Combinations**

1. Different Types of Business Combinations
2. Leveraged Buyout LBO
3. Reasons for Combinations
4. Accounting for Business Combinations
5. Consolidation of Financial Statements

### **23. Leases**

1. Types of Leases
2. The Accounting for Operating Leases
3. Lessee Accounting for Finance Leases
4. Lessor Accounting for a Finance Lease

### **24. Sale-Leaseback Transaction**

### **25. Employee Benefits**

### **26. Accounting for Income Taxes**

1. Presentation on the Income Statement
2. Calculation of Current Income Tax Expense
3. Calculation of Deferred Income Tax Expense
4. Temporary Timing Differences
5. Deferred Tax Assets
6. Deferred Tax Liabilities
7. Calculation of the Deferred Tax Expense or Benefit
8. Calculation of a Valuation Allowance

### **27. Accounting Changes**

1. Changes in Accounting Policy
2. Changes in Accounting Estimate
3. Correction of Errors

### **28. Accounting for Foreign Operations**

1. Restatement of Foreign Currency Financial Statements
2. Foreign Currency Transactions



**29. Financial Instruments**

1. Derivatives

2. Categories of Dividends

## **1. Financial Accounting Standards and Statements**

-based on IAS and IFRS not US GAAP

### **1. Basic Concepts of Financial Accounting**

1. all assets and liabilities are recorded at their historical cost
2. revenue is recognized when it is earned and an exchange has taken place
3. match expenses and revenues in same period; matching principle
4. accounting estimates need to be objective and verifiable
5. focus on material items
6. accounting standards must consistently applied
7. must be full disclosure of relevant events in the financial statements
8. accountants are conservative

$A = L + SE$

$R - E = NI$

### **2. The International Accounting Standards Committee**

-IASB founded in 1973

-compliance with IFRS is not mandatory, though many countries use them

### **3. The International Accounting Standards Board**

*2 main bodies*

#### **1. the trustees**

-appoint the IASB members, exercise oversight and raise funds

#### **2. the IASB**

-sole responsibility for setting standards

-8 of 14 board members must vote for new standard

-also is a Standards Advisory Council SAC and International Financial Reporting Interpretations Committee

### **4. Objectives of Accounting Information**

-objectives are driven by the needs of the external users of financial information

-primary focus is information about an enterprise's performance provided by measures of earnings and its components

*Provide information that is:*

1. useful to those making investment, credit, and other business decisions

**-investment and credit decisions**

2. helpful to determine amount, timing, and uncertainty of future cash flows

**-assessing cash flows**

3. disclose economic resources, claims to them, and the changes therein

**-enterprise assets and claims on those assets**

-additional information comes from other sources, but is not audited and so should be treated with scepticism

### **5. Qualitative Characteristics of Accounting Information**

*Limitations*

1. timeliness
2. cost/benefits
3. balance among other qualitative characteristics; which is most important
4. true and fair view

*Characteristics of good accounting information*

**1. Understandability**- reasonable educated person

**2. Relevance**- affected by materiality

**3. Reliability**- faithful presentation, substance over form, neutrality (independent auditor), prudence (conservative), completeness

**4. Comparability**- within 2 different time periods (consistency); between 2 different companies (standardization)

## **6. Elements to the Financial Statements**

-building blocks of the statements

### ***Balance Sheet***

1. assets

2. liabilities

-both use valuation accounts: accumulated depreciation or unamortized bond premium

3. equity or net assets

-only in for-profit businesses

### ***Income Statement***

1. revenues

2. expenses

3. gains

4. losses

-gains and losses from transactions not in the ordinary course of business

## **7. Recognition of Financial Statement Elements**

-determination of when an item should be recorded

### ***2 criteria before recognized***

1. probable future economic flow either to or from the firm

2. must be measurable with sufficient reliability

-recognize revenue when it is realized and earned; when the earnings process has been substantially completed; or service performed, time of the sale

\***realized**- nonmonetary converted to monetary

\***recognized**- recorded in the accounting records

-losses do not need to be realized to be recognized; losses are recognized when they are incurred, or assumed, as a future loss becomes apparent to the entity

## **8. Measurement Attributes of Assets and Liabilities**

### **1. current (replacement) cost**

-spent today to replace the item; inventory written down to LCM may be carried at current cost

### **2. current market value**

-cash received in the normal disposition of an asset with a 3<sup>rd</sup> party

### **3. net realizable value**

-amount expected to be received from the asset in the due course of business; **short-term receivables and damaged inventories**

### **4. net settlement value**

-amount firm expects to pay to settle a liability in the normal course of business; used to measure **trade payables and warranty obligations**

### **5. present value**

-takes into account the time value of money; requires additional information about interest rates and time periods; **long-term payables and receivables**

-when an entity is no longer a going concern, it must use liquidation values for its assets; usually will be below market value

## **2. The IAS Financial Statements**

*Complete set of financial statements includes:*

1. balance sheet (statement of financial position)
2. statement of income
3. statement of changes in equity
4. statement of cash flows
5. notes to the financial statements
6. presentation of accounting policies

### **1. The Balance Sheet**

-statement of financial position; relationships at a point in time

-helps users to assess the liquidity, financial flexibility, profitability, and risk of a company

-current and non current distinctions for assets and liabilities that is expected to be settled (for liabilities) or converted into cash (for assets)

-the operating cycle is the average time between the acquisition of resources (inventory) and the final receipt of cash from their sale

#### **1. Assets**

\***current assets**- converted into cash within 1 year

\***investment**- assets to either provide a return or increase in value over time

\***operational assets**- noncurrent assets the company uses in the process of generating revenues

\***valuation accounts**- accounts used to adjust the value of the asset on the balance sheet

-IAS differs from GAAP in that least liquid are listed first

#### **2. Liabilities**

\***current liabilities**- those that will be settled within the year

\***noncurrent liabilities**- those that will not be settled within 1 year

#### **3. Owner's Equity**

-amount theoretically distributable to the owners in the event of a liquidation; assets remaining after liabilities are subtracted from assets

\***capital contributed**- sales of shares

\***retained earnings**- profits not distributed through dividends

### **2. Statement of Income**

-summary of all transactions involving income, expenses, gains, and losses for a period of time

-uses **accruals accounting**, meaning items recorded when they occur, not when cash is transacted; can be quarterly or annual basis

-uses temporary accounts and then closes to the permanent accounts at period end

#### *Methods of Presentation*

##### **1. single step**

-all revenues and gains are put together, and all expenses and losses

##### **2. multi step**

-individual classes

\***gross profit**- difference between sales revenues and COGS

**\*operating profit-** gross profit minus selling and administrative expenses

### **3. Cost of Goods Sold**

-cost the company paid for what was sold to customers; could be finished goods bought for resale or raw materials

-manufacturing companies include conversion costs as well (labour and machine costs)

BI + purchases – obsolete inventory – stolen, lost, or damaged - EI = COGS

-assumes no losses due to spoilage; must be subtracted as well

### **4. Classification of Expenses**

**\*selling expenses-** salesperson's salaries, marketing expenses, commissions, credit and collection costs; includes shipping out costs

-shipping in costs are included in inventoriable amounts for item

**\*general and administrative expenses-** accounting costs, legal fees, officer's salaries, wages of staff and insurance

-share depreciation expense among departments

**1. extraordinary items-** no longer classified separately on the income statement; reported as non-operating activities

**2. discontinued operations-** when a firm decides to sell a significant part of their business

-disclose: description, dates, carrying amounts, analysis, net cash flows

### **5. Statement of Changes in Equity**

1.net profit or loss

2. items of income expense, gain or loss that are reported directly into equity and do not appear on the income statement

3. cumulative effect of changes in accounting principles

4. correction of errors

### **6. The Statement of Cash Flows**

-1 of 3 main statements: balance sheet and income statement

-reports receipts and uses of cash

-purchase and sale of cash equivalents will not be reported, since they are simply changing forms of cash

-we know the final answer before we begin; total cash flows must be equal to the change in balance of cash and cash equivalents from the last 2 balance sheets

#### **1. Operating activities**

-interest paid, interest and dividends received, taxes and tax refunds, gains from trading securities

#### **2. Investing activities**

-purchasing and selling fixed assets; making and collecting loans; acquiring and disposing of stocks of other companies, debt instruments, available-for-sale or held-to-maturity securities

#### **3. Financing activities**

-issuance of stock, treasury stock transactions, paying dividends, issuing debt, obtaining and repaying loans, repayment of debt principle amounts

#### **4. non-cash investing and financing activities**

-not presented on the SCF, but will be a separate report at the end

-converting debt to equity, buying or selling with stock, getting gifts, anything noncash

*2 methods for operating activities*

-financing and investing use the same method regardless

**1. direct method-** start with the income statement and make adjustments to each individual line to take out non cash such as depreciation expense and gains and losses on fixed assets

-a disclosure of the reconciliation between net income and cash flows from operating activities is required; this reconciliation is essentially the indirect method of preparing the SCF

-start with cash collected from customers, then minus *items recognized as revenue but not collected (receivables)* and minus *items collected but not recognized as revenue (unearned revenue)* and minus *accounts receivable written off*

-change in allowance for doubtful accounts does not change this, as just a mathematical calculation

**2. indirect method-** make all the adjustments to net income figure

-direct goes line by line and indirect starts with the net income figure

-a disclosure of the amount of cash paid for interest and cash paid for taxes is required

### **3. Accrual Accounting**

-can be either cash basis or accrual basis accounting

\***accrual entries-** occur when an event has happened, but no money has been transacted yet; leads to payables or receivables

\***deferral entries-** happen when money has been exchanged, but the goods or services have not yet been exchanged; unearned revenue, magazine subscriptions

### **4. The Accounting Cycle**

#### **9 Steps**

1. identify and measure transactions and other events to be recognized
2. journalize- record transactions to the journal entry
3. post from the journal to the ledger; individual journal entries to the accounting ledger
4. prepare unadjusted trial balance
5. adjust trial balance; year-end adjustments for accrued and deferred items
6. prepare financial statements
7. close temporary accounts; transfer NI to the RE
8. prepare post-closing trial balance to prove the adjusting and closing procedures
9. possible reversing entries; optional; only can be made for accruals and

### **5. Revenue Recognition**

-main accounting issue is recognition of revenue, and when the record

-income is revenue obtained from normal business operations; contributions of owners to business, taxes collected, and VAT taxes are not revenue

-when similar goods are exchanged, no revenue is recognized

-amount of recognized revenue is market value; simply for cash, more tricky for other assets

-when cash flows are delayed, PV and FV must be employed; difference is interest revenue

#### **5 Criteria Revenue Recognition from Sales of Goods**

1. transfer of title; transfer of risk and reward of ownership

2. company no longer has involvement in goods or control of goods
3. amount can be measured reliably
4. probable economic benefits will be realized by the company
5. costs of transaction can be reliably measured; matching principle

#### ***Revenue Recognition on Long-Term Contracts***

- use the percentage of completion method
- may have to make adjustments for newly recognized assets or liabilities from contracts

#### **1. Instalment Method of Profit Recognition**

- item is sold on credit and when amount that will actually be recovered is uncertain; profit recognized only when cash is received from the customer
- so set up appropriate accounts, and use a profit % to calculate profit; move deferred profit account from balance sheet to income statement as profit
- deferred gross profit account is a contra-asset account to the instalment receivables
- this method is used rarely

#### **2. Cost Recovery Method of Profit Recognition**

- even more conservative than instalment method; no profit is recorded until cash collected exceeds cost of sales; profits on sale are deferred until profit is received
- used when there is no basis to determine the collectibles of the future payments

#### ***4 Main Points Consignment Sales***

1. goods belong to consignor until the consignee sells them
2. cost of transporting the goods to the consignee are inventoriable costs
3. consignor will recognize revenue for the entire selling price that the consignee sells the goods for
4. commissions are selling expenses for the consignor

#### ***Revenue Recognition when Right of Return Exists***

- seller should usually always recognize
- if infrequent, then account for item when it occurs; if happen a lot, then set up an allowance account for returns, just like for doubtful debts
- most importantly, if the amount of future returns can be estimated, then recognize revenue

#### ***Unearned Revenue***

- liability on the balance sheet, and recognized as profit on the income statement when the money is actually earned

### **6. Interim Financial Reporting**

- do everything the same as for the annual statements
- but, items such as extraordinary items or the writing down of inventory due to a permanent loss in value should be expensed entirely in the period in which the event occurred; if the loss is temporary and will reverse by year's end, it does not need to be recognized in the interim period

### **7. Financial Accounting of Assets**

- resources controlled by the company expected to bring some future economic benefit

#### **1. Cash Management**

- can lead to bankruptcy or higher interest charges
- short term to pay obligations as they become due and long term to grow as needed

***Factors Influencing How Much Cash Needed***

1. how much cash is needed in near future
2. amount of risk firm is willing to take in respect to solvency
3. level of other short-term assets a firm holds
4. available return on other short-term assets (interest rates)
5. business cycle (seasonal fluctuations)

***Reasons for Holding Cash***

1. medium of exchange
2. precautionary measure
3. speculation
4. compensating balance

**2. The Operating Cycle**

-£ of days inventory is held before sold and £ of days accounts receivables are held before collection; total £ days firm has funds invested in working capital

**\*cash conversion cycle-** operating cycle – average age of accounts payable

-decrease this £; either by collect receivables faster or delay payables

***Speeding Cash Inflows***

**\*float-** time between payment being mailed and being available for use; comprised of mail float, processing float, and clearing float

***Float Reduction Procedures***

1. invoices mailed as soon as possible
2. encourage prompt payment
3. EDI, EFT, ACH
4. credit cards- charge 1 – 3% rates
5. wire transfers
6. lockbox systems- interest received must be greater than maintenance costs
7. concentration banking

***Slowing Cash Outflows***

1. payments made as close to deadlines as possible
2. utilize the cash discount periods
3. use checks (drafts)

**\*disbursement float-** paying the money

**\*collections float-** receiving the money

-maximize disbursements float and minimize collections float

4. payable through drafts- similar to checks
5. zero-balance checking accounts

-allows interest bearing account to pay for debts as they become payable in the zero-balance account

6. overdrafts- similar to zero-balance but must pay fees

7. calculate compensating balances on an average daily basis rather than on an absolute basis

**3. The Cash Budget**

-or cash management and working capital budget

-if cash shortfalls can be predicted, can get more favourable loans

-especially important for seasonal businesses



## 8. Marketable Securities Management

-related to cash management, but is the least common method of current asset management

-firms will usually use borrowing to meet unexpected needs, so keep extra funds in short term investments with little risk and short maturity so they can become available as needed to meet financial obligations

-must consider: default risk, interest rate risk, liquidity, tax position

-have an investment policy statement outlining objectives and discrepancies

### *Types of Marketable Securities*

#### **1. treasury bills**

-less risk less return

-income is exempt from local and state taxes, but not federal taxes

#### **2. certificates of deposits CDs**

-savings account that can't be withdrawn without penalty; relatively high interest rates but lower than commercial paper and banker's acceptances because they are less risky

\***negotiable CD**- higher denominations, traded on secondary markets, regulated by SEC

#### **3. money market accounts**

-similar to checking accounts, checks written is limited, but wire transfers are not

-balances can be withdrawn without penalty, but lower rates than CDs

#### **4. high-grade commercial paper**

-unsecured, large denominations 100K; sold at discount, like T-bills, and paid up at maturity

#### **5. banker's acceptance**

-bank writes the check on itself; international transactions

#### **6. eurodollars**

-US dollars in foreign banks; for currency risk translation

#### **7. money market mutual funds**

-invest on portfolios of short-term marketable securities; makes them available to smaller investors

#### **8. treasury notes and bonds**

-long term US debt; when purchased close to maturity, act as short-term

#### **9. repurchase agreements**

-essentially guaranteed short-term loan for securities; will buy them back at a later date

### **1. Cash and Marketable Security Management Models**

#### **1. Baumol Cash Management Model**

-based on the EOQ model; firm is computing the optimal cash level to receive every time it converts marketable securities to cash

-balances the costs of converting marketable securities to cash with the lost interest rates

-opportunity cost is the interest costs lost

$$OC = \sqrt{2bT/i}$$

-where: OC is the optimal level of securities to convert to cash; b= fixed cost per transaction; T= total demand for cash for the period; i = interest rate (opportunity costs)

#### **Assumptions**

1. demand for cash will be known and constant
2. cost of converting securities to cash is known and fixed
3. opportunity cost is known and constant

## **2. Orr-Miller Model**

- tries to fix assumption of the Baumol model that demand for cash is not known and constant; creates an upper and lower limit for the cash that a firm holds
- whenever the balance goes outside this corridor, the firm must do something

## **2. Receivables**

- most common is the A/R
- include cash and trade discounts when initially recording the A/R
- cash and trade discounts apply only to the product, not shipping costs

## **3. Accounting for Cash Discounts**

- 2 methods

### **1. Gross Method**

- recognizes the receivable as the full amount; any discounts that accrue will require an adjusting entry
- includes contra-revenue account for discounts given

### **2. Net Method**

- recognizes the receivable as potential discount and is recorded net of discount
- includes a revenue account for discounts forfeited

## **4. Determining the Amount to be Received and Valuing the Receivables**

- do not overstate assets; conservatism
- to reflect amounts expected to be collected at balance sheet at year end 2 methods can be used
- do the same things, just calculate differently
- contra accounts are not closed out at year end, they always have a beginning balance

### **2 things done same**

1. determine amount of receivables to be collected, or not collected (same thing)
2. calculate bad debt expense firm needs to recognize for the period for uncollectible receivables

### **1. % of Sales Method**

- estimate the amount of credit sales that will not be collected (bad debt expense)
- works through the income statement to value bad debt expense correctly; ending balance in the allowance for doubtful accounts becomes the balancing figure

### **2. % of Receivables Method**

- estimate the ending receivables that will not be collected
- works through the balance sheet to make sure the accounts receivable is correctly stated; bad debt expense becomes the balancing number
- can also be done using an aged accounts receivable listing; different %'s for each listing
- under both, the allowance for doubtful debt account will have the same exact journal entries; the difference is the figure in the T-account we are calculating, and which figure is a residual figure; we use a % of sales for 1 and % of A/R for 2

## **5. Writing off a Receivable When it Becomes Uncollectible**

- under both methods this is the same

### **Steps**

1. set up the allowance account (contra-expense account) with the calculated % for uncollectible debts, but do not credit A/R yet
2. debit allowance for uncollectible accounts
3. credit accounts receivable

-this entry does not impact the working capital of the company, because this is adjusting of accounts and %'s already determined

## **6. Collecting Previously Written-Off Receivables**

### ***2 journal entries are made:***

-reversal of entry to write it off

1. debit accounts receivable
  2. credit allowance for doubtful debts
- record collection of cash and reduction of receivable
3. debit cash
  4. credit accounts receivable

### ***Receivables as a Source of Cash***

#### **1. discounting**

-receivable sold to a third party

**\*with recourse-** seller retains liability

-discount rate usually charged to control for the fact that seller still retains liability

**\*without recourse-** purchaser assumes liability

-if receivables are discounted with recourse, a contingent liability must be disclosed for the face amount of the receivables that were discounted; may be done in footnotes or with a contra-asset account

#### **2. assigning**

-receivables are assigned to a bank or other institution for the receipt of cash; this receipt of cash is a payable and interest is charged by the bank for outstanding payables

**\*general assignment-** borrower can replace new receivables for those that are collected

**\*specific assignment-** new receivables may not be substituted and the principle amount must be paid to the bank

-in assigning A/R, the cash collected is by the original holder of the A/R; in factoring, payment is made directly to the bank

#### **3. factoring**

-factor assumes the risk of noncollection and handles the collection; sells the receivables  
3 payments charged

1. reserve- % of receivables withheld until all have been collected; for returns and when all collections are made
2. fee some % of A/R
3. interest rate that is applied to the amount of money that is advanced to the company for the purchase of the A/R; higher than the market rate

#### **4. pledging**

-no journal entry is made, but some of the receivables are given to a 3<sup>rd</sup> party as a guarantee

## **7. Notes Receivable**

-claims to future payment not arising from ordinary course of business; different from A/R in that they are longer in nature, have interest built in, and arise from unusual transactions

### ***2 Types***

#### **1. Reasonable Interest Rate Notes Receivable**

-long-term recorded at face value and redone every year NPV; short-term treated at face value and not discounted (like A/R)

-carrying amount is the NPV and this is from which interest revenue will be calculated  
 -premium or discount is amortized over the life of the N/R using the effective interest rate method

-a premium reduces interest revenue for the recipient and a discount increases interest revenue for the recipient

## **2. Non-Interest or Unreasonable Interest Rate Notes Receivable**

-when the interest is calculated into the face amount of the note

-recorded as a receivable at the face amount and the difference between its face amount and the sales price and is put into a discount account that is amortized as interest revenue

-when the interest rate is unreasonable, must be calculated accordingly to: fair value, market value, or PV

## **8. Inventory**

-shows up on both balance sheet and income statement as part of COGS

### ***5 Important Inventory Items***

-3 classifications: raw materials, WIP, finished goods

#### **1. Valuation of inventory when it is purchased and recorded**

-include all the costs paid in order to get the inventory ready and available for sale: shipping, insurance, taxes, everything

-debit inventory and credit cash; pro rate when differences exist

-the discounted price is the price that is recorded

-for FOB destination (sold when reach destination), shipping expenses are selling expense by seller and not included in COGS or inventory; for purchaser only record cost of inventory

#### **2. Which specific items of purchased inventory should be included in year end inventory**

1. In-Transit goods- depends on whether they are FOB destination or FOB shipping

2. Consigned goods- remain with the company that holds them, including shipping costs

3. Obsolete inventory- not included in inventory balance; written off in period becomes obsolete as an expense or loss

### ***Determining which item is sold***

-IFRS no longer allows LIFO

1. FIFO- oldest item goes out first

-gives higher ending inventory balances, lower COGS, and higher profits in periods of rising prices than LIFO

2. weighted average- average all together

3. specific identification- low quantity, high value items

#### **3. Frequency with which value of inventory is calculated**

### ***2 Methods***

1. Periodic

2. Perpetual

-FIFO gives the same number for perpetual and periodic, because the oldest unit is always the oldest unit

-weighted average becomes the moving average under perpetual system

4. recognition of permanent declines via the LCM (NRV) method

#### **9. Lower of Cost or Net Realizable Value**

-under IAS 2 referred to lower of cost or net realizable value NRV; LCM=LCR

NRV = selling price – costs to complete – selling costs

-applying it to each item individually will provide the lowest amount for ending inventory

### **5. estimation of ending inventory amounts where ending inventory can't be counted**

-when: damaged and need count for insurance, stolen, or interim

#### **2 Other Methods**

##### **1. Gross**

-assumes the gross margin (profit/sales price) is constant and stable; essentially same formula as COGS, but solves for different variables

##### **2. Retail**

-used by department and retail stores that label each item

-count retail value of inventory at year end, then \* by CR ratio

\***CR credit-retail ratio**- cost of inventory/ retail value of the inventory

-need: cost of beginning inventory, cost of purchases, retail value of beginning inventory, retail value of purchases, net mark-ups, markdowns, sales

-first physical count inventory then find CR ratio

##### **A. Weighted average retail method**

-all these methods break into 2 columns: C and R

-includes beginning inventory in the C/R ratio

##### **B. FIFO retail method**

-does not include beginning inventory in the C/R ratio

-purchase returns must be subtracted from purchases for both cost and retail

-purchase discounts the company receives are subtracted from cost of inventory only

##### **C. NRV method**

-assume to use NRV, as this is correct under IAS (conventional method)

-does not include net markdowns; net markdowns still used to calculate ending inventory at retail but is not included in the calculation of the CR ratio

## **9. Property, Plant and Equipment**

-IAS 16; usually largest asset on the balance sheet

### **7 issues**

1. measurement at acquisition and initial recording
2. depreciation of PPE
3. subsequent expenditures for repair, maintenance
4. disposals of PPE for cash
5. disposals by exchanges for other fixed assets
6. impairment of PPE
7. depletion of PPE

#### **1. Measurement at Acquisition**

-include all costs necessary to get ready for use; cost of inventory to be included in accounting records

-included everything, including: razing costs, taxes, insurance, permits

-usually paid for with cash, but if not: issuance of securities (FV of stock, then FV of asset); instalment (cash acquisition price would have been); donated (minus costs, depends on governmental unit or not); internal construction (include interest on loans)

#### **2. Depreciation**

***need 3 things***

1. estimated useful life
  2. estimated residual value; book value cannot be depreciated below salvage value
  3. depreciable amount- amount that must be depreciated over useful life of asset; capitalized amount (cost of asset) minus salvage value
- land is not depreciated
  - journal entry has no effect on the value of the asset; use a valuation account (not closed at year end) called accumulated depreciation; credit this and debit depreciation expense
  - this gives us the carrying value of the fixed asset (cannot be below residual value)

***Depreciation Methods*****1. straight-line depreciation**

-simplest= depreciable base (cost minus residual value) / estimated useful life

**2. sum of the year's digits SYD**

-accelerated depreciation method; sum years denominator; numerator is each year, big first

**3. double declining balance**

- 200% method; double what straight line would be in first year
- calculates depreciation expense using previous year's amount, unlike the others
- this method uses book value at the beginning of the period
- many firms use this and switch to straight line later

**4. units of production**

-however many units can be produced, then how ever many were that year and take them off

**5. depletion**

-depreciation method for natural resources; essentially units of production

**\*mid-year depreciation rule-** for year of acquisition and year of disposal; assumes all assets are acquired and disposed on June 30th

**3. Subsequent Expenditures**

- either expensed in period incurred (does not improve asset) or capitalized and depreciated (improves asset)
- debit expense and credit cash

***Disposals***

-when disposed, all associated accounts (fixed asset and accumulated depreciation) must be written off books and gain or loss recognized (FV received – book value)

**\*book value**= cost – accumulated depreciation

- debit cash, accumulated depreciation, and loss; credit fixed assets and gain
- when disposed by donation firm debits a donation expense account and credits asset account

-receiving entity will credit revaluation surplus and debit asset

**Revaluation and Impairment of PPE**

**\*impairment-** compare discounted future cash flows with book value; if book value is less, write it down and report a loss for the period

**\*revaluation-** fair value at revaluation date minus subsequent accumulated depreciation; if revalue 1 thing, must do all other similar things as well

-items should be revalued when there is a material difference between the FV of asset and carrying value; any gains are credited to equity accounts known as **revaluation surplus**

-but if the gain was a recovery of a previous loss, then it is reported in income statement

#### **4. Intangible Assets**

-must be separable or arise from contractual or other legal rights to be identifiable as an intangible asset

-must be separable, able to be sold; include all normal costs

-licenses, patent rights, franchises, trademarks and trade names, copyrights, water rights, customer lists, some software (not OS)

-IAS 38 prohibits recognition of internally generated intangible assets, except in special cases: goodwill, brands, mastheads, publishing titles, customer lists

#### ***R&D***

-primary internally generated intangible expenditures

-IAS 38 divides into 2 groups: research and development (application of research)

-expenses from research are expenses in income statement in period incurred; if certain requirements are met, close to completion, then development stage can be recognized as intangible asset

-once the development expenses have been expenses, they can not be changed if the conditions are met

#### ***Goodwill***

-must be reported as separate line on the balance sheet; others are combined together

-only purchased goodwill may be recognized in accounting records, although it may be developed internally as well; should be recorded as an asset but reviewed on an annual basis for impairment; not amortized

#### ***Negative Goodwill***

-very rare, when the purchase price is less than the value of the assets

-reported on income statement for the period, never on balance sheet

#### ***Amortization and Impairment of Intangible Assets***

-amortization begins when the asset is available for use; must first define finite or infinite life

-when indefinite, do not amortize but review yearly for impairment; when finite, amortize over life of asset: residual value is 0, amortization charges on income statement, impairment reviews as necessary

-if intangible no longer becomes an asset (lose a patent lawsuit), then write down to amount of expected future benefit; write off any losses in that period

### **10. Financial Accounting of Liabilities and Equity**

-right side of the balance sheet

**\*liabilities**- obligations owed expected to be settled with expected future cash inflows from operations

**\*equity**- claims of the owners on the assets; affected by operations, capital inflows, and dividends

#### **1. Current Liabilities**

-those due within next 12 months

-generally record liabilities at PV of future cash payments; but with current just at face value since is the same

**\*definitely determinable liabilities**- those which we can identify both date and amount due

## 2. Accounts Payable A/P

-from normal business operations, neither secured or guaranteed, and include interest in the repayment schedule; record at their settlement amount

## 3. Notes Payables N/P

-longer term than A/P, but still less than 12 months if in current liabilities, and include some interest

-initially record at face value as 1, but when settled debit interest expense account as well as N/P account and credit cash

-sometimes does not require interest payments but includes an interest rate in the total cash amount

## 4. Other Determinable Liabilities

-other current liabilities with a determinable amount: returnable advances and deposits, accrued liabilities (payables), deferred revenues (unearned revenue)

-for these, amount due in current period is current liability and future periods is noncurrent liability

## 5. Estimated Liabilities

### *Warranties*

-guarantees firm's give on their products; can use multiple methods to determine future warranty expense, but must debit warranty expense and credit estimated warranty liability to match when revenues are recognized from sale

-when there is an actual claim, firm will reduce liability but not recognize expense (just like bad debts for credit agencies); debit estimated warranty liability and credit cash

-evaluate estimated liability warranty account every year to make certain it is appropriate

-if warranty period expires, then remove any remaining estimated liability balance that remains; reverse original entry

-as with income tax expense and income tax payable, must calculate both warranty expense and remaining warranty liability

\***warranty expense**- % of sales or whatever

\***warranty liability**- total warranty expenses recognized in the past minus all payments made on warranty claims

## 6. Premiums or Coupons

-are different but accounting is the same

\***premium**- prize for buying a lot; must estimate future amount of premiums, then set up estimated liability account for that amount and recognize and premium expense in the current period (matching expenses from coupon with period revenue received)

\***coupon**- reduction of sales price for consumers; firm that issues them pays the seller; used coupons have been redeemed, and others are unredeemed

-initially: debit coupon expense and credit estimated coupon liability; when redeemed, debit estimated coupon liability and credit cash

-amount of liability on balance sheet at end of year is total expense recognized minus cash for redeemed prizes or coupons

-2 questions for this topic: what is the expense for the period; what is the remaining liability

## 7. Compensated Absences and Post-Employment Benefits

-if material amount is outstanding at end of year, firm must recognize an expense and liability



-compensated absences are vacation, sick days, or holidays; must recognize liability and expense in period incurred if 4 conditions are met

1. services already provided
2. obligation is for things that vest (legal obligation) or accumulate (carry forward)
3. payment of amount is probable
4. amount may be estimated

### **8. Contingent Liabilities**

-can be probable, reasonably probable, or remote

-liability must be **provided against** (liability on balance sheet) and recognized as an expense if it is probable and amount can be reasonably estimated

-if there is a range, use minimum amount, but disclose full range in notes

-if no way to determine amount, make no accrual but disclose in notes

-if reasonably possible disclose with amount in notes

-if remote not accrued or disclosed

-gain contingencies are only recognized when they have occurred; may be disclosed, but cannot be misleading

### **9. Long-Term Liabilities**

#### **3 Types**

#### **1. Long-term N/P**

-when exchanged only for cash, record at cash received

-when exchanged for others, record at face value and assume interest rate is fair

-if there is no stated interest rate or it is unreasonable, then record N/P at either FV or PV

-any difference between recorded value and face value of N/P will be recognized over life of N/P just as it is for bonds

-for non-interest bearing N/P, amortization discount will only be for interest expense recorded

#### **2. Refinancing of Short-term Obligations**

-involves reclassification from current to noncurrent; 1 area where we will relook at balance sheet before year end after balance sheet date

-must have the intent and ability to do so

-ability may be demonstrated by either actually doing it or entering into an agreement to do so

-if some are settled with short-term assets before financial statement issuance instead, that must be shown as short-term obligations on balance sheet

#### **3. Bonds Payable**

### **11. Bonds**

-1 of 2 main ways to raise cash: equity

-has a stated amount (face value), stated interest rate, and maturity date, and information about payments

-main issues relate to issuance price and interest expense each period

-3 main cash flows are: sale of the bond, interest, and payment of the FV at maturity

#### **1. Issuance of the Bonds- Calculating the Selling Price**

-issued at sold at PV of all future cash payments firm will need to make

-both PV calculations (maturity date and interest payments) are made using market or yield rate of interest

-use the market rate of interest not the stated rate of interest (coupon payment) to get NPV

-below 100 is a discount and above is a premium

## **2. Recording the Sale of the Bond in the Books**

-credit bond payable account for face value and debit cash

-if there is a difference between stated and market interest rates, there will be a premium or discount; additional account called premium (gain) or discount (loss)

-these gains and losses are amortized over the life of the bond as part of interest expense

-when stated interest rate is greater than market there is premium; vice versa for discount

-sold at par when they equal each other

-will debit bond discount (loss) and credit bond premium (gain)- valuation accounts

**\*valuation account-** not asset or liability, just used to adjust the carrying value of the bond itself on the balance sheet

-carrying amount of the bond- face value + unamortized premium or – unamortized discount

-interest is not shown because it is not a liability, it is not currently owed

## **3. Amortizing the Premium or Discount**

-amortization of premium will decrease interest expense each period (less than that actually paid) and amortization of discount will increase interest expense each period (greater than that actually paid)

-usually done with the effective interest method, but can use straight line method if they equal the same

### ***2 parts to effective interest method***

**1. interest expense-** carrying amount of bond \* market rate of interest

**2. cash interest paid-** face value of bond \* stated interest rate

-amount actually paid as cash and recorded as interest payable

-each time payment is made: debit interest expense and bond premium (reduction of this account) and credit cash/interest payable and bond discount (reduction of this account)

-the amortization is made each time the payment is made

## **4. Straight-Line Amortization of Bond Premium or Discount**

-provides constant interest expense

-total discount or premium is divided by the number of years until maturity, and this is the amount of the premium or discount that is amortized each year

-here we use the amortization of discount or premium to calculate the interest expense; under effective method we use the interest expense to calculate the premium or discount to be amortized

-only used when the difference is immaterial

## **5. Equity**

-all assets are either owed (liabilities) or owned by (equity)

-can be common or preferred

### **Common Stock**

-allows these owners the right to vote; characteristics are determined by where the firm is incorporated and the registration statements of the shares themselves

-benefit more from success but lose more from failure

### ***Rights***

1. voting

2. dividends
3. pre-emptive rights
4. distribution of assets

**\*par value**- always small, because it represents legal capital; can't be distributed as dividends and is the maximum amount of liability to the owners

#### ***Reasons to Issue***

1. do not have a fixed payment
2. do not mature
3. greater flexibility in issuance
4. appreciated stock value from success

#### ***Reasons not to Issue***

1. firm loses control of itself
  2. limit to the number of shares firm may issue
  3. cost of issuance may be higher than debt
  4. dividends are not tax-deductible to firm or people; taxed twice
- has 1 IPO, other seasoned offerings, and keep shares for the right market conditions with a shelf registration

### **6. Preferred Stock**

#### ***3 ways differs from common stock***

1. may not vote
  2. preference over common in liquidations
  3. receive dividends before common stock
- other possible benefits: cumulative dividends (arrears), callable preferred, convertible preferred, par value is face value, participating preferred for higher dividends with higher profits, redeemable preferred for shares, transient preferred have a special redemption period, some may have voting rights
- main advantage is voting control is not diluted; main disadvantage is that dividends are not tax-deductible and may still have to pay dividends
- value of a share of stock is PV of all future expected cash flows; dividends and possible payment from sale
- pre-emptive rights only exist for seasoned issuances, not shelf issuances
- even without pre-emptive rights, firm can still give or sell rights for new shares
- can be sold **rights-on** (before rights issued) or **rights-off** (after rights issued)
- \*stock warrant**- chance to buy a stock in the future; different from rights in that may be given to anyone and can be attached to other instruments; when attached to a bond reduces the cost of the bond (interest rate)
- like options, do not raise new capital until they are exercised
- when they are attached to a bond, the selling price must be allocated between bond and attachments (warrant)

### **7. Dividend Decisions**

- first decision is whether to pay one or not; depends on many factors, including debt restrictions
- when stocks have traditionally paid dividends, nonpayment will typically result in lower stock price and problems with financing; stock prices typically reflect dividends
- usually will not raise dividend unless can sustain future earnings for it; investors like stability

**\*dividend payout ratio-** cash dividends per common share/ EPS

-dividend policy is commonly part of corporate strategy

### **Dividends**

-represent a good measure of stability; better than income because are longer term

-1 of the costs of issuing shares and 1 of 2 ways shareholders can profit (appreciation)

-payment of dividends depends on stage in firm life cycle

-firm will have a specific dividend policy

### **Important Dates**

1. declaration date- firm makes journal entry recognizing liability

2. date of record- which shareholders are eligible for the dividend; usually 1 month after declaration date

3. ex-dividend date- 2 business days before date of record; stock prices commonly adjust after this date

4. payment date- actually distributed

### **Residual Dividend Policy**

-shareholder only wants dividends to be paid if there are no better investment options for the firm

-how much common equity (RE) the firm needs to maintain target capital ratio; any extra (residual profit) can be distributed as dividends; only deals with equity financing, not debt

**\*income available for dividends=** expected NI next year \* (necessary equity % in capital structure \* capital expenditures needed next year)

### **Stock Dividends and Splits**

-methods where the firm can give shareholders more shares without getting new capital

-total MV or anything else does not change; nor does % ownership

**\*stock dividend-** firm issues its shares instead of cash as a dividend; provides return to shareholders without distributing cash; new firms use this

**\*stock split-** MV of shares is reduced, but £ outstanding increases; par value of share is also reduced; shares become more affordable for potential secondary market investors

-can also do a reverse stock split where the MV of each share increases

### **Treasury Stock**

-firm's stock that has been issued, reacquired by the firm, and then neither reissued or cancelled

### **Reasons for**

1. temporarily provide a market for the firm's shares

2. reconsolidate ownership

3. investment if the firm thinks the shares are undervalued

4. for use in stock dividends or similar transactions

-does not reduce £ of shares issued, just shares outstanding and total SE

-these shares do not receive dividends and do not vote

-TS is a contra-capital account (reduction in SE); debit to increase it

### **2 Methods for recording**

-whichever is used, must be used consistently

#### **1. par value method**

-treats the reacquisition and subsequent sale as separate transactions

-the amount that goes into TS account is the par value

**Acquisition for more than original issue price “loss”**

-debit TS account for par value of the shares and debit APIC-Common Shares for the full amount that was credited when the shares were originally issued; remaining amount is a debit to RE (loss)

-essentially reverse the entry made when the shares were originally purchased with a loss going to RE and any gain going to APIC-TS; credit cash for amount paid

**Acquisition for less than original issue price “gain”**

-same as above, but credit APIC-TS for the gain instead of debiting RE or APIC-TS for the loss

**Reissuance**

-generally treated the same as the original issuance, except that TS is credited instead of common stock and the APIC account credited is APIC-TS not APIC-CS

-debit cash, credit TS for par value, and debit APIC-TS (loss) or credit APIC-TS (gain)

**2. cost method**

-similar to inventory; recorded at cost and then any gain or loss on sale is recorded

-acquisition of TS: debit TS and credit cash

-reissue shares: debit cash and RE or APIC-TS (for a loss); credit TS and APIC-TS (for a gain)

-gains and losses are recognized only on reissuance, not at acquisition

**2 Issues with each**

1. how much TS is debited under each method

2. when there may be a gain or loss under each method

-excess of capital received over par value from share issuances is share premium in the UK and APIC in the US

**Recognition of Gain or Loss on Share Transactions**

-no gain or loss will ever be recorded on the income statement; instead, share transactions are accounted for entirely with SE; only account in share transactions that is not an SE account is cash

-gain or loss is calculated same way; cash paid with book value of shares received or purchased

APIC- Retirement of Shares is treated the same for accounting purposes as APIC-

**Treasury Shares****1. Gains**

-all gains recorded in APIC-Treasury Stock

**2. Losses**

-any losses first come out of APIC-Treasury Stock then out of RE

**General TS Statements**

1. TS is not an asset; contra asset account in the equity section

2. no gains or losses are recognized on the income statement

3. gains are recognized through APIC-TS

4. losses are recognized through APIC-TS, if it has a debit balance, or RE

5. RE will never increase but may decrease from TS transactions

6. total SE is the same under both methods; the only difference is allocation between equity accounts

7. the common stock account is never adjusted

8. net change in owner's equity is due to changes in cash; the cash is the only non-equity account used; a gain is a increase in owner's equity and a loss is a decrease in owner's equity

### **8. Retained Earnings**

- final destination for all profit and loss accounts
- all the profits of the firm minus dividends declared and amounts transferred into paid-in-capital accounts
- all RE begin as unappropriated because they are available for dividends, but become appropriated when they are retained
- there is no legal ramifications or accounting entries, just a statement by the board of directors
- debit RE and credit appropriated RE; this just means this money can be spent on investment projects now and are not free for distribution as dividends; reverse it to close it back

### **9. Statement of Retained Earnings**

- simply beginning RE plus adjustments to get the adjusted RE
- does not include: gains from TS transactions, gifts of property (paid-in-capital), addition's to owner's equity due to reappraisals of property

## **12. Financial Statement Analysis**

- ratio analysis is most common way
- are based on accounting data, meaning uses historical costs rather than current market value; so must be compared in context to other companies, same company, or expectations

### **1. Liquidity (Solvency) Ratios**

- measure short-term viability of a business
- \*current ratio-  $\text{current assets} / \text{current liabilities}$
- most common; working capital as a ratio
- \***quick ratio (acid test)**-  $\text{current assets} - \text{inventory} / \text{current liabilities}$
- more conservative current ratio
- \***defensive interval ratio**-  $\text{cash} + \text{net receivables} + \text{marketable securities} / \text{daily operating cash flow}$
- number of days firm can meet its basic operations costs
- \***working capital**-  $\text{current assets} - \text{current liabilities}$
- dollar amount

### **2. Asset Management Ratios**

- relate to liquidity; firm's use of assets to generate revenue and income
- \***inventory turnover ratio**-  $\text{annualized cost of sales} / \text{average annual inventory}$
- how many times per year we sell the inventory we have; high is usually good
- \***£ of days inventory held**-  $360 / \text{inventory turnover}$
- reflects efficiency of inventory management; low is good
- \***account receivable turnover ratio**-  $\text{net credit sales} / \text{average accounts receivable}$
- efficiency of collections
- \***£ of days receivables held**-  $365 / \text{receivables turnover}$
- \***operating cycle**-  $\text{days sales in inventory} + \text{days sales in receivables}$
- length of time it takes to convert cash into inventory back to cash

\***fixed assets turnover**- net sales/ average fixed assets

-affected by industry, depreciation methods and such; high is better

\***total assets turnover ratio**- net sales/ average total assets

-including investments decreases the ration, do not relate to sales; high is better

### 3. Leverage (Solvency) Ratios

-measure a firm's use of debt to finance assets and operations

-since interest is tax deductible, debt financing can be preferred

\***leverage factor ratio, equity multiplier**- average total assets/ average common SE

-higher leverage means less financing and greater financial leverage

\***debt to equity ratio**- total debt/ SE

-high means a lot of risk and liabilities

\***debt ratio**- total debt/ total assets

-% of funds provided by creditors; lower is better

\***times interest earned, interest coverage ratio**- EBIT/ interest expense

-income statement approach to measuring debt; higher is better

\***fixed charge coverage ratio**- EBIT + long-term lease payments/ interest + long-term lease payments

-extension to include long-term lease payments

\***operating cash flow to total debt ratio**- operating cash flow/ total debt

-most conservative approach including all debt items in the denominator

### 4. Profitability Ratios

-measure earnings relative to some base, such as productive assets, sales, or capital

\***gross profit margin**- net sales – COGS / net sales

-measures amount of sales price available to cover fixed costs and non-manufacturing costs; key to overall profitability

\***profit margin on sales**- NI after interest and taxes/ net sales

\***Du Pont equation**- (net sales/ average total assets) \* (NI after interest and taxes/net sales) = NI after interest and taxes/ average total assets

-ROI may be explained in terms of both efficiency of asset management and profit margin; asset turnover, equity multiplier, and profit margin

\***net operating income to sales**- EBIT/ net sales

\***ROA, ROI**- NI / average total assets

\***ROCE**- NI – preferred dividends/ average book value of CE

\***ROE**- NI / average total equity

### 5. Growth Ratios

-measure changes in the economic status of a firm over time

\***dividend payout ratio for common shares**- dividends paid/ NI available to common shareholders (EPS)

-general principle is that growth firms have low dividend payout ratios

\***dividend yield**- cash dividends per common share/ market price per common share

\***cash flow per share**- net cash provided by operations – preferred dividends/ weighted-average outstanding common shares

-gives the external user an idea of the firm's ability to pay their dividends

### 6. Earnings per Share

-amount of income that each share would have received had all profit been paid out

-2 types

**\*Income Available to Common Shareholders (IAC)**- amount of income available for distribution to common shareholders= NI – all dividends

**\*Weighted-Average £ of Common Shares Outstanding (WANSCO)**- £ of common shares equivalently outstanding during the period

-if the firm reacquires some shares, only the shares outstanding for the proportion of time count

-all stock dividends and splits are assumed to have occurred on January 1; if it occurs after year end but before issuance of financial statements, is treated as having occurred at the beginning of the first period presented in the financial statements

### 13. Basic EPS

-earnings per share for all common shares that were actually outstanding during the period

**\*EPS**= IAC/WANSCO

#### 1. The Impact of Dividends on IAC

-includes noncumulative dividends declared and cumulative dividends earned (dividend payable, not available to common shareholders)

### 14. Diluted EPS

-what EPS would have been had all potentially issuable, dilutive common shares been issued

-includes convertible bonds and convertible preferred shares

-determine the new effect on IAC and WANSCO

#### Convertible bonds

-more income is available because of the reduced interest expense

-subtract effect of taxes from the higher income earned from less interest expense

**\*EPS effect of convertible bonds**- interest on the bonds \* (1- tax rate)/ £ of shares the bonds are converted into

#### Convertible preferred

-whether or not more income would have been available depends on whether the preferred shares were cumulative or noncumulative and if they were cumulative whether a dividend had been declared

-no tax consequences here because dividends are after tax payments

**\*EPS effect of convertible preferred shares**- dividends earned (cumulative) or declared (noncumulative) / £ of shares bonds are converted into

#### 1. Valuation Ratios

-broad performance measures; reflect the basic principle that management's goals is to maximize shareholder value while maintaining social equality

**\*book value per common share**- common SE/ common shares outstanding

-may be misleading because it is focused on book values and not fair values

**\*market to book ratio**- market price per share/ book value per share

-goal is high multiple of book value, which reflects historical costs

**\*PE ratio**- market price per share/ EPS

-greatly influenced by where the firm is in its life cycle; a growth firm will have a high one



-many limitations of ratio analysis, including: window dressing and other common sense things

## **15. Financial Structure**

-consists of current liabilities, long-term debt, retained earnings, and shares outstanding (everything on the balance sheet except assets)

### **1. Short-Term Financing**

-main trade-off is between interest lost on investments and cash held for need

#### *2 types*

##### **1. Trade Credit**

-how early should payment be made to get the discount; make payment within the discount period

**\*calculation**=  $360 / (\text{total period for payment} - \text{period of discounted payment}) * \text{discount} \% / 100\% - \text{discount} \%$

##### **2. Bank Loans**

-short-term bank loans are the most common

-need 2 things: interest to be paid and the effective rate of that interest

##### **Effective Rate of Interest**

**\*simple interest**- interest paid/ borrowed amount

-only charges interest on the borrowed amount

**\*compound interest**- charges interest on the principal plus any accumulated unpaid interest

##### **Loans with Compensating Balances**

-may be a % of the loan or a fixed amount in an interest bearing checking account for collateral

-this raises the effective rate of interest, since not all funds are available to the borrower

-an average compensating balance gives the borrower more flexibility than an absolute compensating balance

**\*EIR**- interest paid – interest received on additional cash required/ amount of the loan – compensating balance

-could already have some cash in the bank so the total compensating balance amount may not be needed

-this also reduces the amount that must be repaid at maturity

##### **Loans with Discounted Interest**

-the bank withdraws the interest from the face amount of the loan

-increases the effective interest rate because borrower now receives less total funds

-but this may benefit both parties, as interest portion is now guaranteed to the bank, reducing risk, and thereby reducing the interest rate that should be charged

**\*discounted interest**= interest paid/ borrowed amount - interest

-can have both a compensating balance and discounted interest- very high effective rate

### **2. Other Sources of Financing**

#### *Secured*

1. chattel mortgages- secured by movable personal property (car)

2. floating liens- secured by changing inventory

3. pledging receivables- often up to 80%, less when riskier

4. warehouse financing- something held at 3<sup>rd</sup> party place

5. field warehouse receipt- possession of inventory changes hands but remains in place
6. inventory financing, trust receipt – debtor sells the inventory for the creditor and assumes the risk

### ***Unsecured***

1. trade credit- spontaneous source of financing; better for the seller
2. repurchase agreements- selling government securities and buying them back later
3. accrued expenses- wages and salaries don't have to be paid until the end of the month
4. line of credit- an amount of money available to a accompany at a bank
5. revolving line of credit- constantly available
6. commercial paper- no active secondary market, cheaper for larger firms though
7. bankers' acceptances

### **3. Intermediate-Term Financing**

-lease financing can be good and bad

#### **1. operating or serving leases**

- normally involves equipment and offices
- terms are shorter than the useful life of the asset
- lessor performs all maintenance; limited risk for the lessee
- main advantage is this is off-balance sheet financing for the lessee

#### **2. financial or capital leases**

- lessee is essentially buying the asset
- legal standpoint, lessor retains title, but from the economic standpoint the lessee assumes all risk
- must record an asset and liability on balance sheet
- for finance lease, just bypass the 3<sup>rd</sup> party (bank)

#### **3. sale-leaseback**

- sells an asset and then immediately leases it back
- typically have tax benefits for the lessee, but not much difference for lessor in terms of interest on loan and loan payments
- firm will do this when the interest rate to the bank is higher than the cost of renting the equipment, or for an operating lease to keep it off the balance sheet and reduce liabilities

## **16. Long Term Financing**

-can come from internal growth (profits) or external growth (debt and equity)

### **1. Debt-Bonds**

-same as above

### **2. The Selling Price**

-same as above

### **3. Characteristics of Bonds**

-usually have restrictive covenants, sinking fund, call provisions, and be puttable (holder can call it)

### ***Advantages of***

1. no loss of control of ownership
2. total cost of the bond is limited and known
3. interest paid on bonds is tax-deductible
4. if callable, can eliminate them whenever

### ***Disadvantages of***

1. interest is fixed and required
2. chance of default on the debt
3. interest rate risk in the future
4. large cash payment at maturity

#### **4. Types of Bonds**

1. debenture bond- not backed by collateral, higher interest rate
2. mortgage bond- backed by collateral, less risky
3. income bond- pay interest only if certain level of income is reached, riskier
4. convertible bond- can convert into common stock
5. subordinated debentures- do not have first claims to assets, higher interest rates
6. serial bonds- mature over a period of time for the firm
7. zero-coupon bonds- no coupon, sell at a discount
8. junk bonds- very risky, high rewards
9. participating bonds- can participate in dividends with high profits
10. indexed bonds- interest rate is pegged to an index

### **17. Capital Structure**

- capital structure is determined by the liabilities and equity on the balance sheet
- sources of permanent financing include: long-term debt, preferred stock, common equity

#### ***Optimal Capital Structure must Consider***

1. future prospects of the company
2. equity market
3. composition of assets
4. amount of risk
5. interest rates for debt

#### **1. Cost of Capital**

- the cost a firm must pay to acquire capital to entice investors
- required return (investor) is equal to the cost of capital (firm)
- becomes the hurdle rate for investments; does not always hold in the short term

#### **2. Weighted Average Cost of Capital (WACC)**

- must calculate each component( debt, preferred stock, common equity) and determine the appropriate weights

\*WACC= total costs of financing/ total amount of financing

#### **3. Cost of Debt**

- the interest rate that needs to be paid (yield demanded by investors), adjusted for taxes
  - bonds are usually the cheapest form of new financing
- $Cd = \text{Cost of debt before tax (effective rate)} * (1 - \text{tax rate})$
- when the tax rate increases, cost of debt decreases

#### **4. Cost of Preferred Stock**

- similar to debt, but the dividends are not tax deductible
- must consider flotation costs

$Cps = \text{Dividend} / \text{selling price} - \text{issuance costs}$

#### **5. Cost of Common Equity**

##### ***2 ways to raise common equity capital***

##### **1. retained earnings**

-opportunity cost of better investments; so is essentially the same as the cost for new equity

-firm will first use RE then issue new equity

## **2. new common equity**

-incurs floatation costs, making its cost higher than RE

-more expensive than debt because investors require additional return since they get no dividends or coupons

$Cns = (\text{next dividend} / \text{selling price} - \text{issuance costs}) + \text{annual \% dividend growth rate}$

### ***Models for valuation of the cost of retained earnings***

#### **1. Dividend (Gordon) growth model**

$Cns = (\text{next dividend} / \text{selling price}) + \text{annual \% dividend growth rate}$

#### **2. CAPM**

-specifies expected return is a function of only beta

$$r = r_f + B(r_m - r_f)$$

-risk free asset has a beta of 0

-beta over 1 means stock is riskier than the market, beta less than 1 means it is less risky than the market

#### **3. APT**

-allows more risk factors to be considered than CAPM

$$r = r_f + B_1K_1 + B_2K_2 + B_3K_3 \dots$$

-impractical to use

## **18. Capital Structure Decisions**

-firms must keep its WACC as low as possible

### **1. The Marginal Cost of Capital**

-the marginal WACC is always increasing, because the firm will use cheapest sources of financing first

## **19. Risk Management**

### **1. Risk**

-the chance that an unwanted and detrimental event will take place

-investment risk is just investing; portfolio risk is all together, and US T-bills are the least risky

### **2. Types of Risk**

1. interest rate risk- price risk

2. reinvestment rate risk

3. purchasing power risk- inflation

4. default risk

5. liquidity risk

6. exchange rate risk

7. business risk- depends on many factors

8. total risk- standalone risk, a single asset

### **3. Portfolio Risk**

-the risk of an individual asset when it is held in combination with other assets

-you want to diversify the correlations of the assets

-if the correlation is less than 1 their movements offset each other

**\*non-market, diversifiable, unsystematic risk**- can be eliminated through diversification in a portfolio; strikes, fires

**\*market risk, relevant systematic**- cannot be diversified away; economic conditions  
 -market risk is measured by the beta coefficient  
 -can use CAPM to determine the return each asset must provide to a well-diversified portfolio

#### **4. Portfolio Management**

-goal is to achieve a fully diversified or efficient portfolio  
 -economic theory assumes investors are risk averse; they require more return for greater risk

##### ***Indifference curves***

1. steeper the slope, more risk averse
2. higher the indifference curve on the graph, more utility is gained
3. each one's indifference curve is unique

#### **5. Risk Management Tools**

##### ***2 most common hedging techniques***

##### **1. futures**

**\*long hedge**- contract to buy in the future; protects against price increases

**\*short hedge**- contract to sell in the future; protects against price decreases

##### **2. swaps**

-2 parties agree to trade a payment stream, usually a payment on debt

-primary purpose is to match the characteristics of the firm's revenue stream with that of its payment stream

**\*interest rate swap**- exchange a fixed rate for a floating rate

**\*currency swap**- exchange currency in which payment is made; yen for dollars

#### **20. Leverage**

-relates to the magnification of changes in volume (revenue) into larger % changes in profit; 15% revenue increase leads to 50% profit increase

-greater the fixed costs to overall costs, the greater the leverage

##### **1. Operating Leverage**

-relationship between % change in revenue (volume) with % change in operating profit (EBIT)

-the more fixed costs, the greater increases and decreases in profit will be

-fixed costs: depreciation, rent, insurance, salaries

**\*DOL**= %change EBIT/ % change in revenue

##### **2. Financial Leverage**

-exists from the presence of fixed financing costs; dividends and interest

-the more fixed financing costs, greater increases and decreases in profit will be

**\*DFL**= % change in NI/ % change in EBIT

##### **3. Total Leverage**

-how much the NI will increase or decrease relative to changes in sales (revenue)

=DOL \* DFL

**\*DTL**= % change in NI/ % change revenue

#### **21. Accounting for Investments**

-long-term investments in other firms

### **3 methods**

1. cost- no significant influence; 1-20% voting stock
2. equity- significant influence; 21-50% voting stock
3. consolidated- controls; 51-100% voting stock

-rule is based on influence and control; could have 80% of stock but no control, must still use cost method

-investments in preferred stock are always cost method; preferred dividends are dividend income not investment income

## **22. Business Combinations**

-future form of the business: legal form, financing, size

### **1. Different Types of Business Combinations**

-2 main types: merger and acquisition

#### **1. merger**

-both parties must agree; combine assets and liabilities

#### **4 Types**

1. horizontal- same industry
2. vertical- suppliers or customers
3. congeneric- just related products
4. conglomerate- different industries

-amalgamation is an international merger

#### **2. acquisition**

-when 1 company buys or sells enough to get a voting majority

\***asset purchase**- owner's must agree

\***stock purchase**- just give a tender offer, regulated by the SEC; buy shares on a pro rata basis

#### **3. takeover**

-may be friendly or hostile, and include mergers, acquisitions, and proxy contests

#### **4. proxy contest**

-attempt by unsatisfied shareholders to change management; whoever is leading it must provide all necessary information to the voters; must file proxy requests with SEC 10 days before mailing them to voters

### **2. Leveraged Buyout LBO**

-issue large amount of junk bonds by the management to take the company

-can reduce administrative costs and interest on bonds is tax deductible

#### **Attractive features for LBOs**

1. established operations
2. stable earnings and cash flows
3. small outstanding debt
4. assets for collateral
5. stable technology and no new R&D needed

#### **3. Reasons for Combinations**

1. management
2. synergy
3. operational synergy

4. financial synergy
5. market power
6. strategic position
7. tax benefits
8. undervalued acquisition
9. managerial motivation- agency problem
10. diversification

### ***Opposition to Combinations***

1. greenmail- management buys back the shares for more than market value
2. staggered election of board members
3. golden parachutes
4. fair price provisions- buy new shares cheaper
5. poison pills- anything poisonous
6. flip-over rights- get greater interest in acquiring company for their current stock
7. flip-in rights- shares gain greater voting power
8. stock efforts- issue more, reverse tender, ESOP, white knight merger, crown jewel transfer, going private, LBO

### **Valuation and Pricing the Combination**

#### ***Nature of the bid affects***

1. combined firm's capital structure
  2. tax positions
  3. shareholder stances
  4. government regulation needed
- use a capital budgeting analysis, analyzing: NPV cash flows, transaction costs, CAPM, debt arrangements, and equity residual

### **4. Accounting for Business Combinations**

-IAS and GAAP use the **purchase method**

#### ***Issues***

##### **1. recording assets and liabilities**

- at fair value, what was paid for them, not book value
- if the acquired firm will continue to exist as a legal entity, the fair value of its net assets is put into the investment account of the purchasing firm

##### **2. recording equity**

- only include income after the purchase; RE of acquired go into the investment account of acquirer; total RE is equal to RE of the purchasing firm
- if 100% of the firm is not owned, a minority interests account must be set up to account for this
- total SE is equal to the parent firm's; the common stock and APIC accounts for the combined firm will be equal to the parent's; may need to be increased if stock is issued in the transaction

##### **3. goodwill**

- exists when the purchase price paid exceeds the fair value of assets received
- is recognized as an asset and needs yearly review for impairment

##### **4. negative goodwill**

- means you got a good deal
- fixed assets will have to be written down over time; long-term investments are not reduced

-any left over is reported as an extraordinary gain

### **5. Consolidation of Financial Statements**

-when 1 firm has control over another, present the statements as 1 single economic entity

-bankruptcy, foreign issues and such can cause 50% to not be ownership

-main exercise is the additional column for elimination of intercompany transactions; an asset for 1 firm and a liability for another

#### **3 main adjustments**

1. elimination of intercompany receivables and payables

2. elimination of the effect of intercompany sales of inventory

-transfer costs and profits be eliminated

3. elimination of the effect of intercompany sales of fixed assets

-profit needs to be eliminated and the carrying value and depreciation need to remain as if it had never been sold

4. eliminate the investment account of the subsidiary on the parent's books

-with minority interests, only add 90% if you only own 90% of the subsidiary

### **23. Leases**

-agreement between the lessor and the lessee

#### **1. Types of Leases**

-can be an operating or capital

-IAS 17, account for a finance lease based on the economic substance of the transaction rather than the legal form

-the lessee and lessor decide separately whether it is an operating or finance lease, so they could account differently for them; rare

#### ***Operating or Finance***

-IAS 17 states that a finance lease is where all the benefits and risks of ownership have been transferred to the lessee

1. transfer of ownership at the end

2. lease has a bargain purchase option

3. term is for major part of economic life; title may or may not pass- 75%

4. PV of payments is greater than fair value of asset- 90%

5. specialized asset

6. if lessee bears risks in value fluctuations

7. if lessee cancels, lessee bears all risks

8. lessee can continue with supplemental below market price

-mainly the first 5

#### **2. The Accounting for Operating Leases**

-just treat the payments as rent expense for lessee and rent revenue for lessor

-there is no interest in an operating lease

-since the only liabilities are the rent accrued at the end of the period, this is an off-balance sheet form of financing for the lessee

-the lessor keeps it on the books, depreciates it, and does not recognize a gain or loss

-all direct costs incurred by the lessor can either be expensed or amortized over life of lease

-rent expense needs to be the same each period, even when months are free because the services provided are the same



- use the straight line method, so free months will reduce rent expense each period
- lessor will do the same for unearned revenue or rent receivables
- when rent expense is different from rent paid, use a balancing account called prepaid rent or 'rent payable'

### **3. Lessee Accounting for Finance Leases**

- essentially financing the purchase with a loan from the lessor
- account for in 2 parts: purchase of fixed asset and obtaining and repaying the loan
- debit the fixed asset and credit the lease liability
- the difference between the recorded selling price and actual cash paid is the interest expense each period; not yet a liability
- the liability balance decreases by the interest rate \* current balance as interest expense
- if the first payment is made on the date the lease is entered to, this reduces the lease liability; usually the same thing
- the current liability on the balance sheet is the amount it will be reduced by in the coming year

#### ***4 things***

1. record a fixed asset on the books
  - what the selling price would have been; PV of MLP
  - lowest interest rate; implicit interest rate or market rate
  - if the fair market value is lower than PV of MLP, use the FMV
2. depreciate that asset
  - depreciable amount is same for everything; straight line method
3. record a payable for future lease payments
4. recognize interest expense each period just like a loan

#### **Minimum Lease Payments**

- includes all amounts lessee is obligated to pay lessor

  1. periodic lease payment
  2. required purchase price or bargain purchase option
  3. any residual value guaranteed by the lessee

### **4. Lessor Accounting for a Finance Lease**

#### ***5 things***

1. remove fixed asset from books
2. recognize a revenue from the sale of the asset
3. recognize a gain or loss on the sale
4. record a receivable
5. record interest revenue each period
  - reported as rent revenue not rent expense
  - to get period revenue, take the fair value and divide it by the PV factor for the number of years at the desired rate of return for an annuity

#### ***2 Additional Needs to be met for Financing Lease***

1. collectibility of payments
2. no important uncertainties regarding costs to lessor about the lease

#### ***3 Types of Leases for Lessor***

- accounting methods are the same, just the names are different
- to determine which, just compare PV of MLP to carrying value of asset
- difference between the 2 is the source of profit for the lessor

**1. sales-type lease**

-when PV of MLP > CV

-2 profits: 1 from sale of asset (gain or loss) and 1 from interest on financing

-difference between the FMV of the MLP and the cash payments is recorded as unearned interest income

**2 direct financing lease**

-when PV of MLP = CV

-1 profit: interest on financing, because the PV of the of MLP = CV

-the book value of the asset on the lessor's books will be the same as the FV of the MLP

**3. leveraged lease**

-special type of direct financing lease involving 3 parties; an additional long-term creditor

**24. Sale-Leaseback Transaction**

-account for a sale of a fixed asset and then a lease

-for finance leases the gain from the sale part of the transaction will be deferred and recognized over the term of the finance lease

-for operating leases, this gain or loss will be recognized immediately; unless the sales price is greater than the fair value, then the gain will be deferred and amortized over the life of the asset

**25. Employee Benefits**

-under IAS 19, recognize a liability when an employee has provided a services in exchange for a benefit that will be paid in the future, and an expense for when the entity makes use of the service provided by the employer

**5 Categories**

1. short-term benefits- due within 12 months of the rendering services

-expensed on an accrual basis and recognized as a liability

--wages, paid leave, sick leave, profit sharing, bonuses, medical, housing, cars

2. post-employment benefits- payable after completion of employment

-include pensions, life insurance, and medical care

3. other long-term benefits- anything else

4. termination benefits- either voluntarily or involuntarily

5. equity compensation benefits- stock options and similar

**Pensions****1. defined contribution plan**

-employer deposits a portion of salary into an account; the employees bear risk of loss from inflation or other

**2. defined benefit plan**

-employee receives set benefits in the future, so the employer must set aside enough to meet those needs; have no idea how much to set aside; employer bears risk of loss in value

-employees become vested, legally permissible, after a period of time working

**\*defined benefit liability**- the account on the balance sheet; negative represents an asset; maximum that may be shown is the amount of unrecognized actuarial losses plus unrecognized past services cost plus PV of future refunds from the pension plan

**\*defined benefit obligation DBO-** equals the actuarial (estimated retirement period) PV of all benefits attributed by the pension benefit formula to employees for services rendered prior to a particular date, based on future salary levels up to retirement  
-not all benefits will vest

### **6 Components of Pension Expense**

- Net Periodic Pension Cost (NPPC); recognized each year as the pension expense
- 1. current services cost- takes into account future salaries
- 2. interest on the DBO- increase in DBO due to increasingly due payments
- 3. expected return on plan assets- decreases pension expense
- 4. unrecognized past services cost
- the cost of retroactively granted benefits will be accounted for in the year the benefit is granted and future periods; amortized of the life of
- 5. actuarial gains and losses
- compares reality to the calculations and amortizes the gains or losses; corridor approach
- 6. curtailment or settlement gains and losses
- reductions in payoffs or employees and settlements
- there may be a transition under IAS 19 when this accounting standard is first adopted
- multi-employer plans are defined benefit plans
- when insurance companies are used, they are defined contribution plans

## **26. Accounting for Income Taxes**

- main issue is deferred taxes, difference between what we pay and what we need to pay
- first calculate the book income per IAS 12 then get the taxable income per governmental
- book income on financial statements; accrual basis IAS
- taxable income on tax return; cash basis tax code

### **1. Presentation on the Income Statement**

#### **2 tax expense items on income statement**

- \*current income tax expense-** amount actually payable and due to the government
- \*deferred income tax expense-** tax effect of timing differences; positive or negative
- together give us total income tax expense

### **2. Calculation of Current Income Tax Expense**

- = taxable income \* income tax rate
- income tax expense may be different from income tax payable
- if a taxable loss occurs, expense will be 0 and a credit will be gained

### **3. Calculation of Deferred Income Tax Expense**

- deferred tax benefit or liability is simply the change in the period

### **4. Temporary Timing Differences**

- primary reason timing differences exist is that IAS income is calculated on the accrual basis and tax income is calculated on the cash basis
- this temporary difference arises because the entries will reverse over time; depends on whether the item was included in tax or books first

### **5. Deferred Tax Assets**

- future deductible amount
- 1. revenues that are taxable before they are included in book income- deferred revenues
- 2. expenses that are included in book income before they are taxable- accrued expenses

### **6. Deferred Tax Liabilities**

-future taxable amount

1. expenses or losses that are first deductible for tax income- prepaid expenses
2. revenues or gains that are first included in book income- credit sales

### **7. Calculation of the Deferred Tax Expense or Benefit**

-if you know the future tax rate this calculation is very simple

### **8. Calculation of a Valuation Allowance**

-if it more likely than not that all deferred tax asset will not be used, 50%, then a valuation account must be set up (doubtful debt, impairments)

-if we will not realize all the deferred asset, then total income tax expense increases

-no valuation account is set up for deferred tax liabilities

## **27. Accounting Changes**

-IAS 8 gives 3 options: retrospectively, currently, and prospectively

### **1. Changes in Accounting Policy**

*Changes are Permitted if*

1. will result in more reliable and relevant presentation of financial statements
2. required by an accounting standard setting body
3. required by statute

### **2 Methods**

1. benchmark treatment- retrospective treatment; restatement of prior periods and adjustment to beginning RE balance
2. alternative treatment- current or prospective treatment; just current period

### **2. Changes in Accounting Estimate**

-no changes are made to prior periods for depreciation or other estimates, just going forward

### **3. Correction of Errors**

-just adjust the current period RE with a credit or debit and the corresponding asset or liability account affected by the error

-self-correcting errors don't need any attention

## **28. Accounting for Foreign Operations**

-2 main issues; restatement and transactions

### **3 Types of Currencies**

1. presentation currency- currency the statements are in
2. functional currency- currency of the primary economic environment
3. foreign currency- any other currency used

### **1. Restatement of Foreign Currency Financial Statements**

*-IAS 21 dictates 3 Stages*

#### **1. Adjust and update**

-change from foreign to functional currency

#### **2. Translate**

-balance sheet translated at closing rate

-income statement translated at spot rate

-no gains or losses are recognized on income statement

#### **3. Consolidate**

-basic rule is that a foreign exchange reserve must be used in the balance sheet for the cumulative exchange differences

## **2. Foreign Currency Transactions**

### **3 Steps**

1. date of entering; record transaction at current exchange rate on that date
2. every balance sheet date; current exchange rate on the balance sheet date; gain or loss reported as income from continuing operations on the income statement
3. date of payment; gain or loss recognized for the actual payment and is written off

## **29. Financial Instruments**

-IAS 39 deals with financial instruments

### **2 Properties of**

1. obligation to deliver cash on potentially unfavourable terms
  2. right to receive cash on potentially favourable terms
- gives rise to a financial asset for 1 and a financial liability for another

### **1. Derivatives**

-can be used to hedge or speculate

\***cash flow hedge**- considers changes in cash flows

\***fair value hedge**- considers changes in fair values

-speculation is gambling, but provides liquidity to the market

### **2. Categories of Derivatives**

#### **1. forward arrangements**

-2 things: must be honoured, and no initial payments

-futures are more standardized than forwards and traded on more exchanges; swaps are between 2 parties

#### **2. options arrangements**

-give the holder the right not the obligation to buy (call) or sell (put)

-host contracts can have embedded derivatives

### **Recognition**

-IAS 39 requires contracts to be recognized the day entered into, not the day settled

-must review annually for impairment

-can switch between classes, but is rare; if so, at FV the day of switch

### **3 classes**

#### **1. held-for-trading**

-transaction costs are expensed

#### **2. held-to-maturity investments**

-transaction costs are capitalized

#### **3. available-for-sale financial assets**

-transaction costs are capitalized

## III. US GAAP

### I. Concepts and Standards for Financial Statements

1. Concepts and Standards for Financial Statements

### II. Typical Items:

1. Receivables and Bad Debt Expense
2. Inventory
3. Cash, Cash Equivalents, and Marketable Securities
4. PP&E; Intangible Assets; R&D
5. TVM
6. Liabilities
7. Notes and Bonds Payable

### III. Specific Transactions

1. Equity Accounts; EPS; Stock Options
2. Presentation and Disclosure in Financial Statements
3. Consolidated and Combined Financial Statements and the Equity Method
4. Financial Statement Analysis
5. Revenue Recognition
6. Miscellaneous Topics
7. Financial Instrument
8. Foreign Currency Transactions and Translation
9. Accounting for Income Taxes
10. Leases

### IV. Governmental Entities

1. Governmental Accounting

### V. Governmental not-for-profit

1. Not-for-Profit Accounting

## CMA

### Financial accounting

\***environmental assumptions**- specific economic entity, going concern, unit of measurement, periodic basis

\***accounting principles**- historical cost, revenue recognized when earned, match expenses, objective and verifiable, material, consistency, full disclosure, conservative

### Financial statements

#### **1) balance sheet**

- statement of financial position; point in time
- assets, liability, equity: proprietary theory
- converted within one operating period still a current asset

#### **2) income statement**

- closed to permanent retained earnings each period; for a period of time
- revenues methods: % of completion, production basis, instalment basis, cost-recovery basis
- expenses methods: cause and effect, systematic and rational, immediate recognition

#### **3) statement of cash flows**

- primarily for receipts and uses of cash
- operating, investing, financing

#### **4) statement of comprehensive income**

- all transactions except those made to the owner (dividends)
- \***other comprehensive income items**- **1)** foreign currency translation adjustments **2)** additional pension liability APL in excess of unrecognized prior service cost **3)** unrealized holding gains or losses on AFS securities **4)** effective portion of gain or loss on a derivative designated as a cash flow hedge
- must be reported on balance sheet as a component of equity

### Accounting regulations

- direct and indirect and internal and external
- GAAP and FASB
- 1933 SEC says rules and regulations
- 1934 created the SEC
- CAP-ARB
- APB-APB Opinions and statements
- FASB- statements and interpretations
- 7 members, discussion memorandum, then 60 days public hearing, exposure draft, standards statement, Interpretation

### GAAP

- uniform standards to measure financial presentations
- A- SFAS, Interpretations, ARB, APB Opinions
- B- FASB Bulletins, SOP, Audit and Accounting guidelines, ETIF, AcSEC

- C- AICPA practice bulletins, ETIF statements
- D- AICPA interpretations, FASB implementation guides
- E- everything else

### **SFAS**

**1- objectives:** useful and understandable information; firm's economic resources and claims and changes

**-characteristics:** entity level, monetary dollar amounts, estimation, already happened

**5- Revenue recognition:** definition of element, measurable, relevant, and reliable

**-realization:** non-monetary into monetary

**-historical cost, current replacement cost, current market value, net-realizable value, net settlement value, present value**

**-going concern assumption**

**-physical v. financial capital maintenance**

**6- 10 elements of financial statements**

**-assets, liabilities, equity or net assets, revenues and expenses, gains and losses, investments and distributions to owners, comprehensive income**

Limitations: only monetary items, one company, past data, judgment and estimation

### ***Balance sheet***

#### **Cash and cash equivalents**

**-most liquid and first on balance sheet**

**-some in and some not- common sense**

**-CE are short term highly liquid and 3 months or less**

**-petty cash with imprest system: cash over or cash short accounts**

**-bank recons= common sense**

#### **Accounts receivable**

**-cash and trade discounts**

**1) gross method- discounts given (contra revenue); allowance for discounts**

**2) net method- no accounts unless guesses wrong: discounts given and forfeited**

**3) sales returns- allowance for returns and allowance for doubtful accounts**

#### **Valuing methods**

**1) allowance methods**

**\*% of sales-** income statement

**-determine bad debt expense**

**\*%of receivables-** balance sheet

**-determine allowance for doubtful debts**

**-aged accounts receivable listing**

**2) direct write off method**

#### **Receivables as cash**

**-factoring with or without recourse; record interest revenue and expense**



- discount notes receivable
- assigning and pledging accounts receivable
- notes receivable are interest or non-interest bearing
- short term presented at face value on balance sheet; long term at NPV
- short term notes receivable reported at NRV
- long-term with reasonable IR- PV of EAR
- long-term with unreasonable IR- discount or premium; this is amortized over the life of the bond;
- gains and losses; depreciation and amortization; calculation of interest revenue and receivable
- impairment of long term notes receivable

### **Investments in marketable securities**

- trading (short term), available for sale, held to maturity (debt)
- record amount paid plus brokerage and other fees
- holding gains or losses for AFS or trading securities
- credit unrealized gain in valuation account; debit unrealized loss
- 1 account for each category
- trading security- reported on income statement under continuing operations
- AFS- under other comprehensive income
- permanent decrease in market value is a realized loss; subsequent repurchases are unrealized
- HTM are recorded at amortized cost, like bonds; fair market value disclosed in notes

### **Financial instruments and derivatives**

- SFAS 133
- derivatives must be recognized as assets or liabilities: fair value is used for balance sheet
- \***FI**- obligation to deliver cash; contractual right to receive cash
- asset for one and liability for other
- \***DI**- zero or small investment, settlement, one or more underlyings and notional amounts
- fair value hedge, cash hedge, foreign currency hedge
- generally reported in other comprehensive income

### **Inventory**

- raw materials, finished goods, WIP
- all preparation costs included in price: FOB selling costs separate
- consignment inventories-include selling costs
- obsolete inventory not counted
- LIFO, FIFO, weighted average, specific identification
- perpetual vs. periodic
- FIFO same in both; LIFO has layers so is different
- moving average in perpetual
- errors, self-correcting
- GAAP requires physical count every year- cycle counting

**Dollar value LIFO**

-calculates whole inventory cost; not unit LIFO

-easier to use and less LIFO layers

- 1) BYQ at BYC
- 2) CYQ at CYC
- 3) CYQ at BYQ
- 4) determine the added layer for the current year
- 5) current bricks times current costs
- 6) add different layers to get ending inventory

**LCM**

-middle of ceiling, NRV; current replacement cost, and floor (ceiling – normal profit amount)

-when done individually, will get lowest amount for ending inventory

**Estimating inventory**

1) gross method-  $\text{sales} * (1 - \text{GMP (sales/selling price)}) = \text{COGS}$

-not for GAAP

2) retail method

-there is a counting of ending inventory, so good for GAAP

3) avg. cost retail method

-cost/retail ratio

4) FIFO (oldest layer) and LIFO (newest layer) retail method

-FIFO with LCM is conventional method; LIFO not used with LCM

**\*LIFO liquidation:** disclosure note for difference between current COGS and LIFO COGS

**\*LIFO reserve:** note showing inventory value if current cost was used instead of LIFO

-LIFO effect is change from 1 period to the next

-purchasing financing arrangement results in a cash liability; difference to interest expense

-noncancelable purchase agreement: bad if cost drops below market; record a loss

**PP&E**

-buying price is all relevant fees

-paid with cash or note payable

-SFAS 34- capitalization of interest for construction purposes

**\*qualifying assets-** used by the company; produced for sale or lease but not normally

-interest can only be capitalized through construction;  $\text{AAE} * \text{IR}$

**Depreciation**

\*estimated useful life, estimated salvage amount, and depreciable amount

1) straight line-  $\text{depreciable amount} / \text{estimated useful life}$

2) double declining-  $\text{double declining rate (2 times straight line)} * \text{book value of asset}$

3) sum of the year's digits- accelerated depreciation method

- 4) units of production- depreciate by number of assets  
 -depletion for land  
 -group depreciation gets no loss or gain on disposal of assets; composite depreciation for dissimilar assets  
 -different book and tax depreciations  
 -depreciation in acquisition year and disposal; actual time of ownership, full in year acquired and non in disposal year; mid-year convention  
 -capitalizations v. expenditures  
 -fixed asset disposal, involuntary disposal, and gift disposals

### Exchanges

- either have (cash flows expected to change) or do not have commercial substance

### **GO OVER**

### Impairments

- if book value > FV, then impaired and adjustment needed  
 \***patents**- amortized if win in court, expense if lose in court; purchase vs. internally create  
 \***franchise**- capitalize costs and amortize over life, like patent  
 -leasehold improvements; can't take with when you leave: A/C, amortize over life of lease  
 -trademark (40); copyright (70)  
 -purchased goodwill is an asset; checked for impairment every year and written down if needed; can also be negative goodwill and maintenance costs  
 -organizational start up costs must be expensed as incurred  
 -intangible impaired assets must be written down to fair value in the period  
 \***research**- the search for new knowledge  
 \***development**- translation of research finding  
 -generally expenses as incurred  
 -only R&D things with other future uses will be capitalized  
 -prepaid expenses are assets

### Computer software

- 1) Expensed  
 -up to the point of establishing technological feasibility; expensed on income statement
- 2) Inventoried  
 -all normal inventorial costs related to manufacturing and shipping
- 3) Capitalized  
 -training materials, coding, and testing of product master  
 -amortization is higher of the straight line and units of production depreciation methods

### Bonds

- PV (price) = annuity schedule (coupon flow \*) + PV schedule (face amount \*)  
 -amortization of bond premium or discount is interest expensed each period  
 -bond payable account credited only for face value of bond  
 -carrying amount of bond is face value adjusted for amortized premium or discount

**\*interest expense-** carry amount of bond \* market rate of interest

**\*cash paid-** face value of bond \* stated interest rate

1) effective interest method- debit interest expense and bond premium and credit cash paid and bond discount

2) straight line interest method- constant interest expense every year; not used a lot

-investing in bonds must be journaled for bond and interest received

-amortize premium or discount as well

-buy the interest that accrued when you buy the bond; just like dividends, certain date

-bond issue costs are deferred and amortized; subtracted from net proceeds, not overall bond liability

-if issued at a discount, there will be a loss on extinguishment; premium might be

-requisite amounts are amortized appropriately

-could be an extraordinary loss

-in-substance defeasance does not remove the liability

-for convertible bonds: book value results in no loss or gain but market value method does result

-term v. serial bonds

-debenture v. guaranteed; guarantor, collateral, collateral trust, mortgage

-registered v. coupon bonds (old style)

-callable, sinking fund, zero-coupon, income bonds

-reported on balance sheet at book value, 1 or 2 lines; fair value in notes

### Leases

1) operating lease- short-term rental agreement

2) capital lease- property and equipment

**\*lessee-** 1) records fixed asset on books 2) depreciates 3) records payable for future lease payments 4) and monthly lease payments, including interest

**\*lessor-** 1) remove fixed asset from books 2) recognize gain or loss on sale 3) record lease receivable on balance sheet 4) recognize interest revenue from lessee

-if any of 4 common sense criteria are met, it is a capital lease

### Pensions

- 2% of highest salary of every year worked until death

= PV of future expected payments

### Taxes

-book income we want to pay; and taxable income we have to pay

-deferred credit or debit just depending

1) current income tax expense

2) deferred income tax expense or benefit

-together equal total income tax expense

-TTD's temporary timing differences; GAAP accrual, tax is cash basis

-simply reversed over time as revenues and gains v. expenses and losses as either deferred tax asset or liability

**Other Liabilities**

-current liabilities

**\*definitely determinable liabilities**- know time and amount due; payables, unearned revenue; notes, accounts, and dividends

**Estimated liabilities**

1) warranties- warranty expense for period and overall warrant liability

2) coupons and premiums- same as for warranties

3) compensated absences- sick and vacation days; sick days are not accrued if they accumulate, only if they vest

-if they cannot estimate amount, just disclose in the notes

4) Contingent liabilities- probable, more than 50%, must be accounted for; reasonably possible or remote contingent (no to both) must be disclosed in notes

-court case is most common

5) Contingent gains- don't put in statements and maybe disclose in notes

6) Refinancing of short-term obligations- must have the intent and the ability to do so

-just changed to long-term on balance sheet

-must actually do it or enter into an agreement

7) troubled debt restructurings-

a) transfer of assets- in full settlement, assets will be less than debt

**\*debtor**- accounts for gain or loss on disposal of asset and then on retirement of debt

-could be ordinary or extraordinary gain

**\*creditor**- will record a loss, possibly over bad debt expense as an ordinary loss; record assets at fair market value

b) modification of terms- total cash payments now due under new terms

**\*debtor**- if total payments less, recognize an extraordinary gain; if more, just reduce liability with future payments

**\*creditor**- account for adjusted receivable using NPV of amount to be received

***Owners' Equity*****A. Shareholder's equity**

-balancing portion of asset sheet

-contributed capital and retained earnings

1) common stock

-par or stated, v. no par value

-voting: straight or cumulative

-receipt of dividends, preemptive rights, and distribution of assets

-can be issued normally, for property or services, or via subscription

-dividends: date of declaration (payment on books), record, and payment

-liquidating dividends: when APIC is reduced

-for property dividends a gain or loss on disposal is reported in income statement from continuing operations

-small stock dividend(less than 25%); FMV; balancing amount to APIC

-large stock dividend (more than 25%); par value

-stock splits and reverse splits; no journal entries; just memos

2) preferred stock

- no voting; preference in claims and dividends; similar to bonds

- redeemable, callable, or convertible

- cumulative v. non-cumulative dividends; dividends in arrears

- fully v. partially participating shares

### 3) treasury stock

- receives no benefits; voting, dividends

- no gains or losses are ever reported in income statement for stock transactions, rather in equity section

- recognizing gains and losses; can't recognize a gain

- APIC-TS may only have a credit balance; gains recognized here

- losses recognized in either APIC-TS or retained earnings

- CS is never adjusted

- RE may not increase but can decrease

#### a) cost method

- gain or loss recognized only on re-issuance to shareholders

#### b) par value method

- use the par value

- reacquisition and re-issuance are different transactions

- retired shares are treated as if they were never issued; APIC-stock retirement

- not shown on income statement

- authorized, issue and outstanding shares; their effects on treasury stock, stock splits, and stock dividends

- \***stock rights**- only memo for issuing rights; when they exercise a journal entry is made; if not exercised a memo is made; if rights are bought back a journal entry is made

- \***share-based payment plans**- given to high ranking executives; FAS 123(r)

- all options are measured on the grant data

- \***Black-Scholes model**- closed-form model; used for options traded on the exchange, so not good for these, tends to over-compensate

- \***binomial model**- lattice model; makes a tree to give possible future prices

- recognize expense depends on previous services or future services, correct period

- if past, expensed in the period options are granted; if future, expensed over period of services rendered (cliff vesting)

## B. Retained Earnings

- final destination for all profit and loss accounts

- appropriated RE means not available for distribution as dividends

- does not include:

- 1) Treasury stock gains

- 2) gifts of property, goes to PIC

- 3) additions due to appraisals of property

## *Income Statement*

- prepared with accrual accounting for a period of time

- closed to permanent accounts

- 1) Income from continuing operations

- includes revenues and expenses; 1<sup>st</sup> and biggest category
- single step v. multi-step
- revenue and COGS
- expenses are selling and general and administrative

### Revenue recognition

- usually at point-of-sale
- FOB shipping v. FOB destination
- unearned revenue accounts
- recognized at completion if is: 1) ready saleable 2) known market price 3) homogeneous
- usually only agricultural products and precious metals
- revenue equal to contracted selling price
- 1) instalment method**
- get the gross profit %
- any interest due is accounted for separately
- 2) cost recovery method**
- most conservative
- when no basis for future collectibles can be determined
- rarely used, must be disclosed in financial statements
- no interest recognized until total cash received is more than COGS
- 3) deposit method**
- for subsidiary sells
- a deposit from purchaser journal entry is made
- shown as a liability until sale is completed

-if amount of future returns can be estimated, create an allowance for returns account  
**\*channel stuffing**- trade loading, getting distributors to buy more goods at the end of period

- consignment, consignor and consignee
- transportation costs are inventoriable (cost of inventory), reduce overall sales, not an expense
- consignor recognizes total sales revenue, then pays consignee a commission
- royalties earned and expensed are recognized in period earned

#### **1) completed contract method**

- wait until project is completed to recognize

#### **2) % of completion method**

**\*% complete**= costs incurred to date / (costs incurred to date + expected costs to finish)

**\*total profit to date**= expected profit \* % complete

**\*profit this period**= total to date – previously recognized profit

- all losses recognized immediately under either method
- if CIP>BCA, current asset recognized; opposite a current liability is recognized
- calculate profits and losses too

#### **2) Discontinued operations**

- shown net of tax
- must be identifiable and significant

- sell of a franchise counts, not a closure
- reclassify prior statements for comparison
- all gains and losses recognized in period incurred
- pensions, closing costs
- future losses from actual disposal can be recognized early

### 3) Extraordinary events

- net of tax; each item reported separately
- material, both unusual and infrequent
- most usually natural disasters
- insurance reduces the loss on the event

-next 3 of 4 included in RE; not correction of error

#### **\*change in principle**

- retrospective: LIFO to FIFO and long-term contracts
- include a disclosure note
- include “as adjusted” when doing prior statements
- any changes in numbers are on the first restatement

#### **\*change in reporting entity**

- retrospective: consolidating statements

#### **\*correction of error**

- change from accounting estimate that is not GAAP is an error correction
- similar to retrospective, but with term restatement, prior period

#### **\*change in estimate**

- prospective
- sometimes estimates and principles are the same; can be done like accounting principle

### 4) Other comprehensive income

- foreign currency translation adjustments
- additional minimum pension liability in excess of unrecognized prior service cost
- unrealized holding gains or losses on AFS securities
- effective portion of gain or loss on derivatives designated as cash flow hedges
- cumulative element of owner’s equity on balance sheet

### EPS

**\*IAC**= NI - non-cumulative preferred dividends declared – cumulative preferred dividends earned

**\*WANSCO**- stock splits and dividends count for whole period

**\*basic EPS**= IAC/ WANSCO

**\*diluted EPS**= calculate impact of warrants and options

- add convertible preferred shares and bonds

#### **5 steps**

1) calculate beg. EPS

2) calculate impact of warrants and options (**formula**)

3) EPS effect

**\*convertible bonds**= interest on bonds ( 1 – tax rate) / # of new shares



**\*preferred shares**= dividends earned (cumulative) or declared (non-cumulative) / # of new shares

4) Add in EPS effects

5) Keep adding until IDEPS is higher than new DEPS

### **EPS Disclosure notes**

1) EPS figures must be presented on the face of the income statement from continuing operations and NI

2) discontinued and extraordinary items must be presented individually on face of EPS or in notes

3) disclose any potentially dilutive shares not disclosed

4) restate EPS and DEPS for all periods for stock splits and stock dividends

### ***Statement of cash flows***

-1 of main 3

-always presented with IS

-no cash flows per share

-O, I, and F

-inflows and outflows presented separately

-certain financing and investing non-cash activities must be disclosed in the notes

### **Direct method**

-additional disclosure for reconciliation between NI and cash flows from O

**\*cash collected from customers**= Sales revenue + beg. A/R – End A/R – Beg. Unearned + End unearned – accounts actually written off

-do not add in allowance for uncollectible accounts

**\*cash paid to suppliers**= COGS + beg. A/P – End A/P – Beg. Inv. + End Inv. – Beg. Prepaid + End Prepaid

**\*cash paid for taxes**= income tax expense + beg. Taxes payable – end taxes payable + deferred tax benefit – deferred tax expense

**\*cash paid for interest**= interest expense + beg. interest payable – ending interest payable + decrease in bond premium – decrease in bond discount

-fix any other items as well

### **Indirect method**

-additional disclosure for amount of cash paid for taxes and interest

-start with NI

-add all losses, depreciation and amortization back

-subtract all gains

### **Foreign operations**

a) change US non-GAAP into GAAP

b) Re-measurement and translation

**\*functional currency**- used for economic transactions

**\*currency of record**- used to keep books

**\*reporting currency**- US dollar

- 1) re-measurement- from local currency to functional currency
    - use the (monetary/non-monetary) temporal method; any gains or losses from different exchange rate will be reported on income from continuing operations
  - 2) translation- from functional to reporting
    - use the current rate method; gains or losses go to other comprehensive income
    - may only need to do one or the other
    - highly inflationary is more than 100% over 3 years; cannot be used as functional currency
  - c) foreign currency transactions
    - \*forward, future contract-** hedging
      - 3 hedges= fair value, cash, and hedge of net investment
    - \*spec. for. Contract-** making a profit
      - record in books at current rate, update every day
- do examples**

### Investments

- chain of investment with third companies
- 1) cost method- 1- 20%, no significant influence
  - if no control or preferred dividends, use cost method
- 2) equity method- 21-50%; significant influence
  - when equity to cost, use carrying value of equity investment at time of change
  - when cost to equity, retro back to equity for all statements
- 3) consolidated method- 51-100%; ownership
  - record assets and liabilities at fair market value
  - equity and RE goes into the investment account
  - goodwill too; can be negative, then fixed assets are written down to compensate
  - long-term investments in marketable securities are not reduced
  - any remaining negative goodwill reported as extraordinary gain

### Consolidated statements

- more than 50%
- eliminate inter-company transactions and parents' investment account

### Other topics

- SFAS 131 deals with segment reporting information
- 10% and 75%
- deplete natural resources
- DSE-development stage enterprise

### **Securities acts of 1933 and 1934**

# I. Concepts and Standards for Financial Statements

## Financial Accounting Concepts

### **A. FASB has 3 responsibilities:**

- 1) since 1973, it is the sole establisher of financial accounting and reporting standards
- 2) FASB's standards govern the preparation of financial reports
- 3) mission is to establish and improve methods of financial accounting

### **B. How FASB Accomplishes the Mission**

- 1) relies on the concepts of relevance, reliability, comparability, and consistency
- 2) keeps standards current
- 3) considers promptly any possible deficiencies in financial accounting standards
- 4) promotes international convergence
- 5) improves common understanding of the methods and reports

### Standard setting-process

A) **open decision making process**, because the public is affected by rules

B) **FASB follows due process steps** in developing accounting standards

- 1) FASB receives requests for new projects or reconsideration of old rules
- 2) FASB staff summarizes findings and discusses at public meetings
- 3) FASB votes; a simple majority is needed
- 4) FASB deliberates and analyzes the issues at public meetings

## Role of FASB

A) General

- 1) FASB develops broad accounting concepts and standards
- 2) FASB provides guidance on implementation of standards
- 3) FASB's framework helps establish reasonable bounds for judgment in preparing financial statements; and increase confidence in and understanding of financial statements
- 4) Concepts are useful in guiding FASB
- 5) FASB framework will help the public to understand the nature and limitations of financial information

B) Concepts and standards

- 1) FASB's work on concepts and standards is based on research fro new ideas
- 2) Research is conducted by everyone
- 3) FASB's activities are open to the public and under a "due process" system
- 4) FASB actively solicits new views from its constituencies

## **Generally Accepted Accounting Principles (GAAP)**

### **A. Fundamentals**

- A) GAAP is the backbone of financial accounting; includes conventions, rules, and procedures for what is acceptable practice
- B) GAAP is always adapting and evolving with new developments
- C) GAAP is flexible, and is only technical guidance
- D) there may be several alternative and valid ways to interpret an accounting rule

### **B. Hierarchy**- higher has more authority

#### **1) Category A**

- a. FASB statements of financial accounting standards (SFAS)
- b. FASB interpretations
- c. Accounting principles board (APB) opinions
- d. AICPA accounting research bulletins (ARB)

#### **2) Category B**

- a. FASB technical bulletins
- b. AICPA industry audit and accounting guides cleared by the FASB
- c. AICPA statements of position cleared by the FASB

#### **3) Category C**

- a. AICPA accounting standards executive committee (AsSEC) practice bulletins cleared by the FASB
- b. consensus positions of the FASB emerging issues task force

#### **4) Category D**

- a. AICPA accounting interpretations
- b. implementation guides published by the FASB staff
- c. practices that are widely recognized and prevalent either generally or in a specific industry

## **Conceptual Framework of Accounting**

### **A. Statements of Accounting Concepts (SFAC) identifies accounting concepts**

-Addresses financial accounting by the business and the following:

- 1) objectives of financial reporting
- 2) qualitative characteristics of accounting information
- 3) elements of financial statements
- 4) recognition and measurement in financial statements
- 5) using cash flow information and present value in accounting measurements

### **B. Implications**

- 1) this framework will have short and long term effects on financial information views
- 2) eventually, all financial accounting standards will be traced to these concepts
- 3) eventually will result in the restructuring of financial statements and the umbrella of financial accounting
- 4) previous studies have been performed
- 5) this framework will be the basis of all future financial standards by FASB

## **Financial reporting**

- includes, but not limited to, the financial statements issued by an entity

- also refers to any means of communication directly provided by the entity's accounting system
- refers to the external financial reporting by entities; internal managers will need more
- conceptual framework is intended to relate to external users for investment and credit decisions

### **A. Users and Uses of Financial Reporting**

- the objectives of financial reporting also include aspects of the environment it will be used in
- financial reports are largely for the purpose of making business and economic decisions about the best allocation of resources
- reporting is used by: **investors, creditors, and business managers**
- government used financial reporting for: **regulatory purposes, tax purposes, and economic statistics**

### **B. Financial Reporting Characteristics and Limitations**

- there is a cost associated with providing and using the information
- financial information is quantitative in nature, and must have a measure; money
- presentation of financial information involves measurement by means of: **estimation, classification, summarization, judgment, and allocation**
- historical in nature; difficult to forecast the future
- must get info from economy, politics, and industry as well

### **Objectives of Financial Reporting by a Business Enterprise**

- role of financial reporting is to assist in the making of decisions and establish a favourable environment for decision making
- not intended to influence decisions; must be **even handed, neutral, or unbiased**
- to provide info to rational investors, about cash flows, and economic assets or resources
- 5 categories of economic assets
  - 1) economic resources, obligations and owner's equity
  - 2) enterprise formation and earnings
  - 3) liquidity, solvency, and fund flows
  - 4) management stewardship and performance
  - 5) management explanations and interpretations

### **A. Info Contained in Enterprise's Financial Statements**

- A) resources, obligations, and owner's equity
- B) performance and earnings
- C) liquidity, solvency, and fund flows
- D) management explanations and interpretations

### **Qualitative characteristics of accounting information**

#### **A. Usefulness**

- A) qualitative are those that make info useful to users
- B) these are the basis for evaluating info against cost of providing it
- C) these should be used when there are reporting differences

## B. Primary Qualitative Characteristics

1) **Relevance**-indicates the info will make a difference; must be **timely, predictive, and feedback**

2) **Reliability**-free from error and faithfully represents; must have **representational faithfulness, verifiability, and neutrality**

-to be reliable:

\***precision**- does not necessarily have to be precise

\***bias**- could be either from a means of measurement or mistake or lack on integrity

\***complete**- must be complete

\***verifiability**- more than one measurer would have the same results using the same methods; does not mean the correct method was used

\***conservatism**- ensures risks and uncertainty is taken into account

## C. Secondary Qualitative Characteristics

1) **Consistency**- policies and procedures remain unchanged

2) **Comparability**- ca be compared to other info for similarities or differences

## D. Constraints to Usefulness

-most pervasive is that the benefit must exceed the cost

-**materiality**- can still be reliable if it has immaterial errors

-is material if an error or omission would cause a different action; considered simultaneously with importance

## E. Understandability

-indicates the user is able to perceive the significance of the info; a user with reasonable business knowledge

## Elements of Financial Statements of a Business Enterprise

-assets, liabilities, equity, investment by owners, distribution to owners, comprehensive income, revenues, expenses, gains, and losses

### A. 2 Classes of Elements

1) balance sheet, status of an enterprise as of a particular date; assets, liabilities, and equity

2) income statement, events and transactions for a period of time; revenues and expenses

-balance sheet is changed by the income statement

-articulation- change in one means a change in the other

-also notes to the statements

### B. Assets, Liabilities, and Equity

\***asset**- involves probable future benefit and net cash flows; enterprise can obtain benefit and control the access of others to; the event creating the benefit has already occurred; once acquired, remains with the entity until future action

\***liability**- involves the responsibility to transfer an asset to others; responsibility leaves no room for avoiding future sacrifice; the transaction has already occurred; once incurred, remains with the entity

\***equity**- ownership interest in assets after subtracting liabilities; net assets

**A)** changes in assets and liabilities not affecting equity= exchanging assets or liabilities for themselves or each other

**B)** changes in assets, liabilities, and equity= comprehensive income incorporating revenues and expenses and gains and losses; investments by and distributions to owners

**C)** changes in equity but not assets or liabilities= stock dividends, conversions of preferred to common stock, some recapitalizations

### **C. Comprehensive Income**

-includes all changes in net assets (equity) except those resulting from investments by owners or distribution to owners; 2 approaches to divide

1) basic components are revenues, expenses, gains, and losses; individually listed on FS

2) comprehensive income is then segregated into intermediate components by combining the basic

-over the life of the enterprise, comprehensive income will equal the net cash flow of business excluding cash investments by and distributions to owners

-timing of recognition is a significant aspect of measuring comprehensive income

-comp income includes the effects of: exchange transactions and other transfers between the enterprise and non-owners; productive efforts by the enterprise; price changes, casualties, and other effects of interactions between the enterprise and its environment

-closely related to capital maintenance

### **D. Capital Maintenance**

-financial and physical capital approach

**\*financial approach-** relates the value of the resources available to an enterprise; equipment increasing in value increases company value; under this approach, this would be included in comprehensive income

**\*physical approach-** relates to the actual resources available, disregarding changes in value; this equipment gain would not increase company value and comp income would not change

-this concept of capital maintenance directly determines what is included in comp income

### **E. Revenues, Expenses, Gains, and Losses**

**\*revenues-** inflows and other increases in assets, reductions in liabilities, or some combo

**\*expenses-** outflows and other decreases in assets, increases in liabilities, or some combo

**\*gains-** increases in assets from transactions other than normal operations; anything other than revenues or investment

**\*losses-** decreases in assets from transactions other than normal operations; anything other than revenues or investment

### **F. Classification of Gains and Losses**

-classified according to source, examples include:

1) incidental transactions such as sales of investments and dispositions of used equipment

2) nonreciprocal transfers such as gifts, lawsuits, theft

3) holdings of assets or liabilities such as write-down of inventories or changes in foreign exchange rates

4) environmental factors such as damage to flood or earthquake

-can be classified as operating or non-operating

1) Operating- write-downs of inventory to the lower of cost or market, and gains and losses on disposals of property, plant, or equipment

2) Non-operating- losses incurred by a creditor as a result of troubled debt restructuring; and casualty losses

### **G. Accrual Accounting**

-must meet **recognition and measurement** criteria for accrual accounting

-items to be reported result from 3 sources:

1) **transactions**- external events involving transfers between 2 or more parties

2) **events**- happenings of significance to the party; may include internal events such as production and external events such as transactions with other entities, changes in price, and casualties

3) **circumstances**- sets of conditions that result form an event; when debtor declares bankruptcy(event) the account becomes uncollectible (circumstance)

### **H. Implications of Noncash Events and Circumstances on the Financial Statements**

-under accrual, transactions, events and circumstances are recognized in the period they occur, not when cash is collected

-recognizing noncash events and circumstances when they take place results in: accruals, deferrals, allocations, and amortizations

\***accruals**- expected future cash receipts or payments

\***deferrals**- past cash receipts or payments

\***allocation**- (includes amortization) the distribution of an amount according to a plan or formula

\***amortization**- (includes depreciation) specifically relates to the recognition of: income to reduce a liability from a cash receipt, or, expenses or costs of production to reduce an asset resulting from a cash payment

### **I. Concepts to Distinguish Accrual from Cash Accounting**

\***realization** actually occurs when noncash resources and rights are converted into cash or receivables

\***realized**- revenues, gains, or losses on assets sold

\***unrealized**- revenues, gains, or losses on assets not sold

\***recognition**- relates to the actual reporting of an item in the FS of an entity

\***matching**- making sure costs and revenues add up in the same period

### **J. Approaches in Accrual to Recognize Costs as Reductions in Income**

-some transactions involve revenues and expenses

-systematic and rational allocation procedure such as depreciation is used over to spread out over several periods

-if period id indeterminate, assign when costs incurred

## **Recognition and Measurement in Financial Statements of Business Enterprises**



### **A. Financial Statements**

- a set of full financial statements, prepared in conformity with GAAP, should be sufficient to meet the financial reporting objectives of an entity
- this preparation involves proper recognition of what is assets, liabilities, etc.
- this recognition involves presentation on the financial documents with identifying words, numbers, and quantities
- a full set of financial documents should show:
  - 1) financial position as of the end of the period
  - 2) earnings or net income for the period
  - 3) comprehensive income for the period
  - 4) investments by and distributions to owners during the period
- may be separate statements or combined appropriately
- common goal is to report financial position for a period and the factors which caused it
- 4 statements in general

### **B. Statement of Financial Position (Balance Sheet)**

- provides info about assets, liabilities, equity, their relationship to each other
- does not present entity value, reported at historical cost, but give a basis for valuing
- Statement of earnings and comprehensive income (income statement)
- must clearly separate earnings from comprehensive income
- earnings, often seen as net income, will reflect the effects of all revenues, expenses, gains and losses during the period
- earnings will be similar to net income, but does not include cumulative effects of changes in accounting principles; this is covered by comprehensive income

### **C. Statement of Cash Flows**

- reflects entity's cash payments and receipts; operating, investing, and financing

### **D. Statement of Investments by and Distributions to Owners (Owner's Equity)**

- reflects increases or decreases in equity from the owners acting as owners; not as customers, suppliers, employees, or lenders

### **E. Recognition in Financial Statements**

- due to cost/benefit and materiality constraints, an item should be recognized when 4 criteria are met
  - 1) **Definitions**- the item must adhere to the appropriate definition set out in the pronouncements; assets are an asset, revenue is a revenue, etc. 0
  - 2) **Measurability**- must be considered along with relevance and reliability, and must be measurable in money and have the following 5 characteristics: **historical and current costs, current market value, net realizable(settlement) value, and NPV** must be accurate
  - 3) **Relevance**- info has predictive value, feedback, and timeliness
  - 4) **Reliability**- info has representational faithfulness, verifiable, and is neutral
- other guidelines must be followed to affect these changes into equity

### **F. Factors to Consider in Including Revenues or Expenses in Earnings**

- item must be realizable or realized
- items must be earned; gains just have to realized
- expenses and losses are recognized as economic benefits are used up

## II. Typical Items

### 1. Receivables and Bad Debt Expense

#### Basic Description

##### **A. Definition of Accounts Receivable**

- trade accounts receivable; current asset listed on balance sheet (normally with debit balance)
- reasonably expected to be converted to cash during the operating cycle (1 year)
- the opportunity cost incurred by delayed cash receipts is a necessary cost of financing
- debit account receivable and credit revenue

##### **B. Components**

- 1) beginning balance for the period
  - 2) add: credit sales for the period
  - 3) deduct: cash receipts (collections) from credit sales
  - 4) deduct: balances written off because of returns, discounts, or doubtful accounts
- separate accounts: allowances for returns, discounts, and doubtful: all are estimates

#### Anticipating Sales Discounts

- cash discounts are recognized as an expense if the cash payments for the receivables are received within the discount period

##### **A) Net method**

- 1) initial credit sale is recorded in sales and accounts receivable net of the discount
- 2) if cash payment received within discount period, entries are simply reversed
- 3) if cash payment not received in discount period, cash recorded in sales at gross amount and extra is in an additional "discounts not taken" account for gains

##### **B) Gross method**

- 1) sale is recorded at the gross amount
- 2) if cash payment received *after* discount period, entries are simply reversed
- 3) if cash payment received in discount period, cash recorded in sales at gross amount and extra is in an additional "discounts taken" account for expenses

##### **C. Valuing Accounts Receivable**

- the allowance for doubtful accounts (AFDA) is disclosed separately from the gross accounts receivable, that is, with the allowance for sales returns and discounts
- the AFDA is a contra-asset account (negative account) to accounts receivable; the 2 together give the accounts receivable at net realizable value

## **Bad Debt Expense**

### **A. Components of the AFDA**

1) beginning balance(always is a credit balance)

2) deduct: write-offs of any uncollectible accounts receivables

-once the write-off is made, we can reduce the allowance; the allowance is in anticipation of the write-off

3) add: subsequent collection of an account previously written off as bad

-debit cash (increase) and credit allowance for doubtful accounts (increase)

-opposite of 2

-if the overall allowance is excessive because of these, then debit the allowance

(decrease) and credit bad debt expense (decrease); this has a (+) effect on net income

4) add: recognition of bad debt expense for the current period

-debit bad debts expense and credit allowance for bad debts

-once bad debts are known and written off, we don't need the allowance, so it is reduced

### **B. Write-offs and Bad Debt Expense**

-direct write-off method is used by smaller business; appropriate for tax purposes, but not for financial statement reporting purposes

-no allowance account is established; the bad debt is only recognized when the account is written off

-therefore, no matching principle

-net income is reduced by the amount of the bad debt expense recognized, and current

assets are reduced by the amount of the A/R write-off

### **C. Recognizing Bad Debt Expense by the % of Sales Method (Income Statement Approach)**

-here, past experience and knowledge and economic conditions dictate a % of uncollectible credit sales: not cash

-usually 2 to 5 %, and not for cash

### **D. Recognizing Bad Debt Expense by the % of Receivables Method (Balance Sheet Method or Aging Method)**

-an aged schedule is produced: 30, 60, and 90 days past due

-a % is taken of each category

-the total of all categories will be the ending balance in the AFDA account

-a new entry will make bad debt expense equal to the increase in the AFDA; debit bad debt expense and credit AFDA

### **E. Writing off an Uncollectible Account**

-actual write off may occur at any time

-has no net financial statement effect

-the journal entry is just a reclassification of A/R and AFDA

## **Pledging Accounts Receivable**

\*pledging- using accounts receivable as collateral for loans

-usually disclosed in footnote disclosures

### **A. Factoring Accounts Receivable**

\*factoring- the sale of the A/R to another party; they usually assume all risk

-the difference between the sale price and carrying value is a loss; the “loss” may also be in the form of interest expense and/or factoring fees

### **B. Concept of “Factor Holdback”**

**\*factor holdback-** the buyer of the receivables reduces cash payment to the seller by a specific % intended to cover anticipated returns  
 -merchandise returns by customers will reduce the amount of the factor payback payable to the seller at the end of the period  
 -the original seller receives the returned merchandise

### **C. Control and the Financial Component Approach as Applied to the Accounting Treatment of Receivables**

-sometimes difficult to determine if a sale has been made or if the receivables are being used for collateral as loans  
 -financial accounting dictates that both the seller and the buyer must recognize the respective assets they control  
 -under SFAS 140, the financial component approach is used to determine control  
 -a receivable is sold if any of the 3 are met:  
 1) the asset is isolated from the seller  
 2) the buyer now has the right to sell or pledge the asset  
 3) the seller has not retained control through agreements to repurchase or redeem the asset

### **Sale of Accounts Receivable**

#### **A. Journal Entry for the Sale of A/R without Recourse**

**\*recourse-** the buyer bears the risk of uncollectibility; if the buyer is not paid by the customer, they cannot demand payment from the seller  
 -to record sale, debit cash and credit receivables sold  
 -seller has no further obligation, no additional liability need be recorded  
 -a loss will be recorded  
 -debit: cash, loss on sale, and factor holdback receivable; credit: A/R

#### **B. Journal Entry for the Sale of A/R with Recourse**

-debit: cash, loss on sale, and factor holdback receivable; credit: A/R, and recourse obligation (potential liability)

#### **C. Obtaining Cash for Accounts Receivable in Nonsale Transaction: Securitized Borrowing**

**\*securitized borrowing-** when the seller retains control of the receivables  
 -debit: cash, interest expense, factoring fee; credit: factor borrowing payable

### **Sale of Notes Receivable (Discounting)**

**\*discounting-** the sale of a note receivable and so the amount to be conveyed to the seller must be computed  
 -interest to be paid on note is computed; added to face value to get maturity value  
 -maturity value is multiplied by the buyer’s discount (profit) rate for the period of time remaining until maturity: the profit the buyer wants to make  
 -buyer’s profit is subtracted from maturity value to get price paid for N/R

### **Financial Analysis: Ratios for Receivable Analysis**

- working capital is an absolute figure
- \***working capital**= current assets – current liabilities
- current ratio is an indicator of solvency that measures a company's ability to pay off its current liabilities from its current assets
- \***current ratio**= current assets/current liabilities
- quick ratio is a stricter measure than current ratio
- \***quick ratio**= (cash + marketable securities + A/R)/ current liabilities
- accounts receivable turnover is an indicator of operational efficiency that measures how quickly cash is recovered from sales
- \***accounts receivable turnover**= net credit sales/ average accounts receivable

## 2. Inventory

### Inventory and COGS

#### A. Costs Capitalization in Connection with the Acquisition of Inventory

- base purchase price of the goods + costs incurred in preparing the inventory for its use
- \***COGS**= beginning + purchases – ending inventory

#### B. Periodic vs. Perpetual System

- \***periodic system**- end of year; charge **purchases account** when acquisitions are made
- physical count required at end of year
- \***perpetual system**- ongoing; debit inventory account when acquisitions are made
- as sales are made, COGS is debited and inventory credited
- periodic is less expensive to maintain, but perpetual more precise

### Inventory Costing Methods

#### A. Weighted-Average Method

- assign same unit price to items in inventory and COGS
- price is an average ; does not emphasize the balance sheet or income statement
- inventory and COGS will be different for periodic vs. perpetual
- referred to as the moving average method when applied to perpetual system

#### B. FIFO Method

- first in first out, means that items acquired first will be sold first
- favours a fair statement of inventory on the balance sheet
- when prices turnover quickly, COGS is a fair statement
- inventory computed under FIFO is same for periodic or perpetual

#### C. LIFO Method

- last in first out, means items acquired most recently will be sold first
- COGS is computed using most recent prices; inventory using oldest prices
- this method emphasizes the matching principle; good for income statement
- over time, inventory prices for balance sheets may become outdated

#### D. Issues to Consider in Using LIFO

- LIFO is popular during periods of inflation
- with FIFO, as prices rise COGS is computed using old prices, overstating profit
- LIFO solves this, but sacrifices the balance sheet by keeping inventory at old costs
- when LIFO is used as tax purposes, it must be used to compute income for financial reporting purposes as well

#### E. Criticisms of LIFO

- it gives management some manipulative power by controlling purchases at year end, assuming rising prices
- decision to use FIFO or LIFO is a cost flow decision, not a physical flow decision
- when a company changes sales prices use LIFO; when they maintain sales prices, use FIFO

#### **F. LIFO Layers**

- uses layers of new purchases
- perpetual and periodic yield different inventory values when computed under LIFO
- a LIFO reserve will be used to adjust for external financial reporting

#### **Valuation of Inventory Using Lower-of-Cost Method**

- sometimes inventory has to be written down, and the lower of cost or market value is used
- \***replacement cost**- used as market value unless it falls outside of 2 boundaries
- \***ceiling boundary**-estimated sales price less anticipated selling expenses
- equal to the net realizable value (NRV)of the inventory
- if replacement cost is above ceiling, use ceiling
- \***floor boundary**- estimated sales price less anticipated selling expenses and normal profit
- equal to the NRV less normal profit
- if below the floor, use the floor
- if goods are damaged, use NRV
- LCM may applied on item, category, or overall basis
- LCM rule is justified by the matching concept

#### **A. Timing of Inventory Purchases**

- when items are acquired near year end, the terms of shipment determine when they are recorded
- \***FOB destination**- means they are included in the inventory of the purchaser when they are received
- \***FOB shipping point**- means they are included in the inventory of the purchaser when they are shipped by the seller

#### **Discounts**

##### **A. Purchase Discounts**

- \***trade discount**- % reduction in the invoice price given to retailers; occurs when inventory is purchased for resale
- not recorded, just used to establish prices
- if 2 %'s given, the 2nd is applied to the net amount after the 1st

##### **B. Cash Discounts**

- reduces the inventory cost if it paid within a specified time
- 2/15
- Net vs. Gross method (outlined above)

##### **C. Purchase Commitments**

- future promise to buy
- usually as a risk management device to ensure inventory is available
- no special accounting implications, unless amounts are material

-loss or gains are recorded appropriately

#### **D. Consignment Inventory**

-when a consignee sells merchandise for a consignor

-selling and commission expenses are deducted

-this inventory is not reported by the consignee

#### **Estimating Inventory**

-prepare interim financial statements; provide check figure for count; estimate fire and theft losses

#### **A. Retail Inventory Method**

-used only if records are kept at both cost and retail amounts

-estimated ending inventory is first estimated with= beginning inventory + purchases + markups – sales – markdowns – expenses (theft, breakage, employee discounts)

-this estimated ending inventory is then converted to a cost figure by multiplying it by a cost/retail ratio

-3 methods:

1) Conventional retail method= markdowns are left out

2) FIFO retail method., lower of cost or market= beginning inventory and markdowns are left out

3) FIFO retail method, cost= beginning inventory is left out

-page 63 in book

#### **B. Estimating Inventory Using the Gross Profit Method**

-used only when cost figures are recorded

1) COGS- multiply gross profit % by sales and then subtract from sales

2) Ending Inventory- add beginning inventory and use simple logic

#### **C. Dollar Value LIFO**

-dollar value LIFO groups inventory into similar pools rather than handling them individually

-each layer increase is counted in dollars, not units

#### **D. Methods of Computing Price Index**

A) Simplified LIFO approach

-most commonly tested on CPA exam

-company uses an external index

B) Double Extension Method

-company develops own internal price index; only difference between Simplified LIFO

-compares year end quantities to current and **base year** prices

C) Link Chain Method

-compares year end quantities to current and **previous years** prices

#### **Financial Ratios Relating to Inventory**

-inventory turnover measures the number of times inventory was sold and reflects inventory order and investment policies

\***inventory turnover**= COGS/Average Inventory

-number of day's supply in average inventory reflects efficiency of inventory

\* **number of day's supply in average inventory**= 365/Inventory turnover

### 3. Cash, Cash Equivalents, and Marketable Securities

#### Cash and Cash Equivalents

-cash on hand or demand deposits

##### **A. Cash Equivalents**

-per SFAS 95, the characteristics of short-term and liquid investments are:

- 1) readily convertible into cash
- 2) near maturity

-examples include treasury bills, commercial paper, and money market funds

##### **B. Financial Statement Disclosures for Cash**

- 1) Unrestricted cash available for general use

-listed as a current asset on the balance sheet

-simply reported as cash as a separate line item

- 2) Restricted cash set aside for special use

-separately disclosed

-if not available for use within the next year, cannot be classified as a current asset

##### Bank Reconciliations for Cash

-purpose is to move from the bank's cash balance stated as pure cash basis to accrual basis

-start with the bank statement

-identify reconciling items not on bank statement and those not in company's cash records

-for those not in cash records, another entry is required

#### Marketable Securities as Investments

-to generate a favourable return on excess cash until it is needed for operating purposes

-to accumulate funds for long term cash requirement

##### **A. Accounting for Investments in Marketable Securities**

-under SFAS 115, Accounting for Certain Investments in Debt and Equity Securities, the treatment of securities with a public market or readily estimated fair value is determined based on management's designation of the purpose of the security

-in the US, the cost method must be used for securities with public market or readily determined value

-SFAS requires company's to classify based on their intent, 3 categories:

- 1) held-to-maturity (debt securities only)
- 2) available-for-sale (debt-or-equity securities)
- 3) trading (debt or equity securities)

##### **B. SFAS 115 Treatment of Bond Transactions for Held-to-Maturity**

-must be intent to hold until maturity, very subjective

-depending on maturity date, bonds are classified as current or long-term

-any discount or premium is amortized to the income statement

-interest income reported in income statement as income from continuing operations, and on cash flows from operating cash flows

##### **C. any cash flows from purchases or sales reported under investing cash flows**

##### **SFAS 115 Treatment of Stock and Bond Transactions for Available-for-Sale**



- not actively traded but held with the intent until maturity
- could be sold any time, but actively moved
- always recorded at market value; unrealized change is reported directly to stockholder's equity
- interest and dividend income reported as operating income on income statement
- if sold, gains and losses recorded on income statement
- cash flows from purchases and sales under investing section

#### **D. SFAS 115 Treatment of Stock and Bond Transactions for Trading**

- held for current resale
- held to make short term profit, sold frequently, current asset
- initially recorded on balance sheet at cost and then adjusted to market value for each period
- unrealized holding gain or loss is reported in income statement as from continuing operations
- if sold, gain or loss is realized; reported under continuing operations
- cash flows recorded in operating section

-page 92 in notes

- available for sale for trading could be above or below at any time on the balance sheet

#### **E. Impairment Issues with Marketable Securities**

- if permanent impairment occurs with AFS or HTM, then the investment is written down, reported in income statement as realized loss, and this reduced amount is the new cost basis
- management re-evaluates classification with the balance sheet, upon purchase
- when securities are transferred, the gains or losses are reported according to the classification into which they move into
- transfers from HTM is rare
- only an investment in a debt security may be changed to HTM
- to or from trading securities is rare

-page 93 in notes

#### **F. Other Issues**

- cash dividends are recorded as revenue on the date of record
- stock dividends and splits are not recorded by the owner; the book value is just allocated over more shares
- receipt of stock rights is not revenue; but if they do have a value, the book value of investment should be divided between the rights and the stock
- a liquidating dividend is a payment by a company that does not have income
- the owner reduces the investment account and no income is recorded
- a life insurance policy can have a cash surrender value CSV, which is an asset; annual payment on policy less the CSV is an expense
- a company can insure its employees and name itself as the beneficiary, the CSV is an asset
- bond sinking fund is money set aside to pay a bond; if debt is paid this year, it is a current asset, otherwise is a long-term asset

#### **4. Property, Plant and Equipment; Intangibles and other Assets; R& D Acquiring PP&E**

##### **A. Acquisition Cost**

-capitalized expenditures are classified on the balance sheet as tangible and long-lived assets that are being used to generate revenues

-period of use will exceed 1 year

-tangible property, or operational assets, refers to any property that physically exists: land, building, equipment

##### **B. Expenditures: Capital vs. Revenue Expenditures**

-for new acquisitions, all new and necessary costs to acquire asset and get it working will be capitalized

\***capitalization**- costs are added to an asset account(balance sheet), rather than expense account (income statement); they are subsequently depreciated over time

\***revenue expenditures**- items that are immediately expensed

-for assets already in use, new expenditures are only capitalized if they provide future benefit

\***addition**- a major new component; building wing

\***improvement**- replacement of a major component ; substitute the new for old and reduce accumulated depreciation of the old

\***rearrangement**- restructuring of an asset that does not extend life but creates a new benefit, moving to a new city

\***materiality**- immaterial amounts are expensed as incurred

##### **C. Capitalized Items for PP&E**

1) invoice price less discounts

2) sales taxes

3) cost of delivery

4) cost of installation

5) training of employees

6) razing the old building

##### **D. Self-Constructed Fixed Assets: Capitalized Costs**

1) direct materials

2) direct construction labour

3) variable overhead

4) a fair share of fixed overhead

5) capitalized interest

##### **E. Accounting for the Cost of Land to be Used as an Office or Plant Site**

-classified as a long term asset under PP&E

-cost of land includes: basic land cost, cost of land acquisition (commission, title insurance), cost of improvements that will have unlimited life (clearing and grading of land)

-land costs not depreciated over time

-land costs with limited useful lives are depreciated over their useful lives

-not technically included in cost of land; in separate account Land Improvements

##### **F. Interest Capitalization for Self-Constructed Assets**

-Interest costs are capitalized when:

- 1) they are incurred in the construction of PP&E
  - 2) interest costs incurred in construction of inventory for a specific customer; a road
  - 3) no interest capitalized on large quantities of manufactured items; or food or diapers
- amount of interest capitalized each year is= weighted average accumulated expenditures (WAAP) to date X an interest rate
  - if specific debt used, use that rate proportionately, then average the rest
  - if calculated interest is more than actual interest, use actual interest
  - weighted average means, July = 6/12
  - interest earned on temp. invested borrowings may not offset against interest to be capitalized

#### **G. Accounting for Assets Received as Gifts**

- SFAS 116 requires that donated assets received from an unrelated party be initially recorded on the balance sheet at their fair market value FMV. Obtained from appraisal or ready market price
- increases donated revenue on the income statement
- SFAS does not cover donations by the government
- donated assets are the equivalent of donated cash
- depreciated the same once received and put into use

#### **H. Asset Retirement Obligation Provisions of SFAS 143**

**\*asset retirement obligations-** debts that must be paid upon asset retirement; legal requirements

- as soon as this becomes probable, it is recognized as a liability and the asset is debited
- if current FMV can't be ascertained, then a credit-adjusted risk-free interest rate is applied at the NPV, which is the current interest rate for a government obligation during that period, adjusted for the company's credit rating
- this liability increases capitalized cost and thus annual depreciation

#### **I. Acquisition and Sale of Assets with Payments Made or Received Over Time**

- assets may be acquired or sold for future cash payments or receipts
  - a payable is created by a purchase and a receivable by a sale
  - if a reasonable interest rate not stated, then a reasonable one will be inferred
  - for basket or lump purchases each fair cost is calculated as a proportion
- Discounts Arising on the Purchase or Sale of Assets with Future Cash Payments
- the asset or sales revenue is recorded at the present value of the future cash flows
  - the payable or receivable is recorded in the amount of the total undiscounted cash flow
  - set up a discount for the difference; a contra-account to the payable or receivable
  - discount represents the portion of the cash flows which is interest
  - interest is not part of the cost or revenue, it is an expense or income item reported separately

**-page 115 in notes**

### **Use of PP&E**

#### **A. Depreciation**

- has no impact on statement of cash flows, but is recorded on the income statement
- debit depreciation expense(income statement) and credit accumulated depreciation (balance sheet)
- \*carrying or book value= cost less total accumulated depreciation

- only 1 half year depreciation used in acquisition year and disposal year; sometimes used
- if asset not generating revenues, recorded as other asset and no depreciation recorded

### Depreciation Methods

#### 1) Straight Line Depreciation

- records the same depreciation expense every year

\***annual figure**= (cost – salvage value)/ estimated useful life in years

#### 2) Accelerated Methods of Depreciation

- records a higher percentage of expense in the early years of asset use

\***double declining method**= [(cost – accumulated depreciation)] x [2 x straight-line rate]

- 0 in the first year; no salvage value deducted; once = 0, no more depreciation

- alternative is 150 % declining method, where 2=1.5

\***sum-of-the-years'-digits method**= (cost – salvage value) x fraction

- denominator = sum of asset's year life; 15 (5+4+3+2+1)

- numerator= corresponding number of life; 5/15 for 1<sup>st</sup>, 4/15 for 2<sup>nd</sup> year

#### 3) Group Depreciation

- similar to composite method, but this for similar assets

- applies 1 straight line rate to an entire group of assets acquired in the same year but with different lives

- annual depreciation is computed for each asset; then added together, divided by total cost to get a weighted average depreciation rate

- each year the same rate applied to remaining figure

- depreciation stops with disposal of last item or when cost is fully depreciated

- for disposal of single asset from the group

- cash received debited to cash, cost of asset credited to asset, and difference plugged into accumulated depreciation

- no gains or losses are recognized until the retirement of the last asset

#### 4) Cost Allocation, Depletion, of Wasting Assets

- oil wells and gold mines

- computed on straight line method on units, not years

\***per unit rate**= cost less residual value/ number of expected outputs per year

- units are removed to inventory and then to COGS

- because number of units is an estimate, a new depletion rate may be needed every year

#### 5) Units of Production Method of Depreciation

- based on units like depletion method

\***annual depreciation**= (units of current output/ total expected output) x depreciation base

#### 6) Changes in Estimates Used in Depreciation

- make change prospectively from the beginning of the year

- new estimate of number of periods remaining (from beginning of year of change)/ remaining depreciation base ( un-depreciated cost to date less revised residual value)

#### Opportunities for Manipulation

- overstating assets useful life results in less depreciation expense, higher net asset values, and increased net income over the useful life

- management then writes down the overstated assets in a restructuring later on

- could write down assets to record less future depreciation, then get higher future net income
- can report a higher salvage value, giving less depreciation expense and an overstatement of loss

### **Disposal of PP&E**

#### **Disposal of Assets**

- disposal occurs when an asset is sold, destroyed, or otherwise disposed of
- both the cost of asset and accumulated depreciation are removed from the balance sheet; loss or gain is recorded

### **Impairment of Assets**

#### **A. Impairment of Operational Assets**

\***recoverability test**= when the total expected future value of net cash inflows (undiscounted) is less than the current book value

- if impaired, the book value of the asset is written down to fair market value and the impairment loss is recorded on the income statement
- new smaller book value becomes basis for future depreciation
- no future recovery for impairment loss is permitted

If fair market value not available, use the discounted present value of cash flows from the asset; when present value is used a proxy for FMV, use discounted cash flows

-test for impairment when:

- 1) significant decline in the market price of an asset
- 2) significant change in the usage rate, market value, or condition of the asset
- 3) significantly higher costs in the acquisition or construction of the asset
- 4) company decides to sell significantly before end of expected life
- 5) significant and unfavourable changes in the business environment or laws
- 6) a forecast for a significant decline in profitability related to the asset

#### **B. Points to Consider in Testing for Impairment**

- assets should be grouped at the lowest possible levels to determine cash flows
- building and equipment may be tested separately or together
- cash flows should be considered for the period equal to the expected life of the asset
- if grouped, the main asset should be used; all others sold at the end of the main asset
- if loss for group, distributed evenly; no one falls below current market value

#### **C. Impairment for Assets to be Sold or Abandoned**

- asset is reclassified as **held for sale** if: it is immediately available for sale, company actively looking for a buyer, or sale is probable within one year
- held for sales are recorded at lower of book value or net realizable value
- if abandoned, held on books until done so; then, book value removed and loss recognized

\***involuntary conversion**- disposal by natural disasters; handled same ways

- general rule is to record assets at **fair value**
- there must be **commercial substance**- causing a significant change in the future cash flows of a company- to record at fair value

#### **D. Intangible Assets**

- purchased intangibles are amortized unless an unlimited life, internally produced are expensed
- patents, goodwill, leasehold improvements, copyrights, internet domain names, customer lists, noncompetes, databases

### **E. Accounting for Intangible Assets**

- normally amortized with straight-line method over the **useful life** of the asset
- no max period restriction for amortization of intangibles
- organization costs and start-up expenses are expensed immediately
- goodwill is not amortized, just tested for impairment
- intangible assets follow same rules as tangible assets with finite lives for impairment
- if loss is recorded for impairment, can never be recovered; new book value for future amortization

### **F. Accounting for Goodwill**

- only acquired in connection with the acquisition of another company
- not amortized, just checked for impairment loss
- get fair value of **reporting unit** first, then logically determine goodwill left

### **Accounting for R&D Costs Contained in SFAS 2**

- these costs are expensed immediately
- anything used just for R&D, expense it; otherwise, expense proportionately
- purchased patents are capitalized; internal patents are expensed
- legal fees may be needed to considered
- commercial production is not R&D; continuing commercial activity
- R&D performed for Others is expensed as COGS

### **A. Software per SFAS 86**

- until technological feasibility, expensed as R&D
- after technological feasibility, capitalized; once design specifications are met
- amortization begins when available to general public
- capitalized development costs are amortized to the income statement each year using the greater of straight line figure or % of current to expected sales
- software purchased for internal use is capitalized; created internally is expensed

\***ordinary annuity**- due at the end of the period

\***annuity due**- due at the beginning of the period

## **6. Liabilities**

### **Liabilities**

#### **A. Payables and Accruals**

- payables and accruals are current liabilities; many examples
- \***accrued liabilities**- used now, paid in the future; property taxes and payroll
- \***deferred revenue**- money received before work is done; magazine subscription
- liabilities can also be compensated absences and exit or disposal activities

#### **B. Ratios**

**\*acid test (quick ratio)**- measures ability to pay current liabilities from cash and near cash

-(cash + net receivables + marketable securities)/current liabilities

**\*current ratio**- adds cash flow items to quick ratio

-current assets/ current liabilities

### **C. Contingent Liabilities**

-caused by past event but must have a future event for loss to occur; pending litigation

-if loss is probable and subject to estimation, it must be recorded; footnotes disclosure

-if not reasonable and probable, just disclosed in footnotes

-product warranties are a contingent liability as well, but they are recorded every year

-guarantees and coupons recorded as expense

-gift certificates recorded as liability initially then as revenue

-purchase commitments are just recognized in footnotes

### **Employee Benefits**

#### **A. Pensions**

**\*defined contribution plan**- employee contributes, employer may; no liability, employee invests; during the period, a liability; after the period nothing

**\*defined benefit plan**- company promises to pay at retirement; company liable; more complicated accounting, must take into account salary, years service etc.

-net pension expense on income statement

-net pension liability or asset on balance sheet

-subjective measure, which gives managers flexibility in accounting

**\*projected benefit obligation (PBO)**- NPV of future pension payments; net liability

-increases every year because of service costs and interest; decreases with payouts

- calculation per SFAS 132- + service and interest cost, contributions to raise payouts; +/- actuarial gains or losses and prior service costs from plan amendments; - benefits; = end of year PBO

**\*accumulated benefit obligation (ABO)**- uses current salaries; more appropriate for liquidations

**\*plan assets**- the total assets set aside to pay pensions

- calculation per SFAS 132- + employer contribution, plan participant contributions, and actual return on assets; - expenses and benefits paid; = plan assets closing balance

**\*funding**- the amount of cash actually set aside by employer

**\*funded status** = fair value of plan assets- PBO

#### **B. Cost Components**

**\*service cost**- from work done by employees

**\*interest cost**- from passage of time

**\*prior service cost**- from amendment to or new plan

**\*actuarial gains and losses**- changes in actuarial assumptions, or asset valuations

**\*net pension cost**- net combination of all the above

#### **C. Balance Sheet Effects**

-net pension cost is a debit to expense (income statement) and credit to accrued pension liability (balance sheet)

-if accrues pension liability is a debit balance, then it is a prepaid pension cost in asset section

- calculation for funded status per SFAS 132- + unrecognized actuarial losses, unrecognized prior service cost, amortization of actuarial gains; - unrecognized actuarial gains, amortization of actuarial losses; = net pension asset (liability) recorded on balance sheet

-add back losses and subtract out gains

\***minimum liability adjustment (MLA)**- must be calculated to fill in the hole end of year

\***other post-employment benefits (OPPEB)**- health care; usually disclosed in footnotes  
-many required pension disclosures; about 25

\***stock warrant or option**- ability to buy stock at an option price

-stock is recorded at total of stock price and additional cash received

**1) non-compensatory plan**- no value assigned at time of grant; normal entry for stock if converted; is non-comp if all employees have access and discount is less than 5%

-if set purchase price, must convert within 31 days; if % of market, no timetable

**2) compensatory plan**- anything not non-compensatory

-expense recognized over time employee provides services

-fair value of warrants on grant date used to get expense

\***APB 25**- intrinsic value method, based solely on internal factors

\***SFAS 123**- fair value method, based on external factors like stock volatility or option life

-several disclosures related to stock options

\***stock appreciation rights**- used to give cash bonuses to employees over a specified time

-recognize expense and create a liability at the end of every period

## 7. Notes and Bonds Payable

### Bonds and Notes

-formal promises to pay

\***serial bonds**- make periodic payments of interest and principal; instalments

\***term bonds**- periodic interest payments; lump sum principal payment

\***debenture bonds**- not secured by collateral, just general assets of company

\***bond indenture**- gives legal terms of bond

\***bond issuance costs**- amortized with straight line over life of bond; reported as asset  
-SFAS 91

-price is stated as % of face value

-either discount or premium or face value; these must be amortized

\***effective rate method**- [current year discount or premium amortization + (coupon rate x face value)]/ beginning net debt

-more common

\***straight line method**- evenly over life

-bonds are sometimes issues with stock warrants

-if assets must be used to satisfy, it is a liability; preferred stock which must be settled with cash

-when bonds are converted, they are reclassified from debt to equity

-use APIC to account for differences



-sometimes troubled debt restructuring happens

## III. Specific Transactions

### 1. Equity Accounts; EPS; Stock Options

-treasury stock can be either: cost method, par value method, or retirement method

\***date of declaration**- dividend declared, retained earnings reduced

\***date of record**- stock ownership established; owner records receivable

\***date of payment**- when paid

#### Stock Dividends

-company records the distribution as a decrease in RE for the fair market value of the shares and an increase in the common stock for the par value; difference is plugged into the APIC accounts

-if stock dividend is less than 20%, must be recorded at fair market value of newly issued shares

-if stock dividend is 20-25%, must be recorded at par value of newly issued shares

-if over 25%, either way

#### Stock Splits

-company just reduces the par value of the shares so the total par value after split equals the total par value before the split

-key difference between splits and dividends is intent of management

\***EPS**- earnings per share; subtract our preferred stock; just common stock

\***diluted EPS**- takes into account dilutive securities; always lower than EPS

-include stock options and convertible bonds or preferred stock

-disregard anti-dilutive securities in EPS calculation

-per SFAS 128, the effect of contingently issuable shares is not included in basic EPS

#### A. Ratios

-dividend payout measures % of earnings distributed as dividends

\***dividend payout**- dividends per share/ earnings per share

-rate of return on common stockholder's equity measures return on stockholder investment

\***rate of return on common stockholder's equity**- net income available to common stockholders/ common stockholder's equity

-debt to equity shows info for creditors

\***debt to equity ratio**- total debt (all liabilities)/ stockholder's equity

### 2. Presentation and Disclosure in Financial Statements

#### Balance Sheet

-statement of financial position

-distinguished between current and non-current items

-order of non-current assets: long-term investment (securities, cash surrender value of life insurance), PP&E, intangible assets, other assets

-SE: capital stock (common preferred), APIC (capital stock transactions), RE (appropriated and un-appropriated), accumulated other comprehensive income (marketable securities and pensions)

### **Income Statement**

-single step or multiple step format

\***single step**- lists all revenues and gains first; then all expenses and losses

\***multiple step**- lists major revenues first, then expenses for those, then other gains and revenues, then taxes, and EPS

### **Statement of Comprehensive Income**

-reports all changes in net assets of a company other than investments by owners and distributions to owners

3 options: bottom of IS by continuing from NI to arrive at a comprehensive income figure; separate statement that begins with income; statement of changes in SE

3 changes in net assets reported in SE not IS: translation of foreign currency; unrealized gains and losses from securities; recognition of minimum liability from a pension plan

-starts with NI and adjusts for changes in these 3 equity figures

-NI figure may include items that have been previously recognized in computing comprehensive income

### **Statement of Changes in Equity Accounts**

-4 equity accounts: APIC, capital stock, RE, accumulated other comprehensive income

-when material changes occur, must disclose these differences in SE

### **Statement of Cash Flows**

-cash flow stability and future ability

-SCF required whenever IS is produced

-O, I, F

### **Operating Activities**

-2 methods

#### **1. Direct Method**

-reports cash flows from all individual operating activities

-the just subtract all the cash expenses like taxes and COGS; include trading securities

#### **2. Indirect Method**

-starts with NI and removes all noncash items like depreciation and amortization and excess equity income

### **Accounting Policies and Other Notes to Financial Statements**

-purpose of disclosure is to avoid misleading people

-accounting policies must be set forth in the first notes to the financial statements

-depreciation methods, LIFO, translation of foreign currencies, revenue recognition method; anything else material

### **Related Parties**

-affiliates, control, immediate family, management, principal owners, related parties

-material transactions must be disclosed, unless: compensation agreements or transactions eliminated in preparation of consolidated statements

-even when a control relationship exists disclose even if no transactions have occurred

### **Subsequent Events and Subsequent Periods**

-Type I require correction to statements, but Type II require disclosure in the notes

\***subsequent period**- period after balance sheet date until reporting date

**\*Type I-** conditions that existed at preparation of financial statements

**\*Type II-** conditions that arose after preparation of financial statements

### **Other Presentations of Financial Data**

1. Cash basis (pure)
2. Income tax basis- modified cash basis or accrual basis
3. Regulatory Agency basis

### **3. Consolidated and Combined Financial Statements and the Equity Method**

#### **Accounting for Investments**

- % of ownership method
- less than 20%: no significant influence: cost or market
- 20% to 50%: significant influence: equity
- greater than 50%: control: consolidated
- must have control to be consolidated

#### **Equity Method**

- could still use if less than 20%, such as members on the board of directors
- but if no influence, then use cost method
- book value will be equal to SE \* % bought
- excess of payment over book value can be assigned to specific assets, such as land or buildings and is amortized
- any excess that cannot be assigned is assumed to be goodwill, and is not amortized
- amortization reduces the value of the investment account and reduces the amount of income being reported by the investee
- changes in fair market value of the investments recorded by the equity method are ignored
- if investee reports losses, must write down investment account proportionately (not below 0) and recognize its share of losses in NI:
- so it makes sense to own just under 20% if the profits are decreasing, and over 20% if profits are increasing

#### **Consolidated Financial Statements**

- when multiple companies are under the same control
- business acquisitions require disclosures in the notes
- \*combined statements-** all the subsidiaries together without the parent
- can be exceptions when consolidated statements are not required: bankruptcy or government decree
- all consolidations are reported using the purchase method; pooling of interest method not allowed
- purchase price is determined based on the fair market value of all assets and liabilities; also includes direct acquisition costs, but stock issuances are recorded as a reduction to APIC
- allocate any excess of purchase price to the assets; or to goodwill as any time
- any amount assigned to current R&D is expensed immediately
- if a negative amount remains, it goes to non-current assets and distributed; if still remains, goes to extraordinary gain

-goodwill is tested for impairment on an annual basis; goodwill is distributed among the reporting units of the company; then test these reporting units to see if goodwill is impaired

-all intercompany accounts and transactions are offset

\***minority interest**- when 100% is not owned; reflected as a single figure in consolidated liabilities or reduction in consolidated IS

-only take at date of acquisition, and after acquisition all profits are included; same as for any other company

\***push-down accounting**- for separate financial statements for large wholly owned subsidiaries; 90% or more

-the consolidated statements remain the same, but the subsidiary reports at fair value not historical cost; requires a revaluation account which is eliminated in consolidated statements against the investment in subsidiary account

\***variable interest entities**- off-balance sheet company for passive activities or R&D; must be absorbed by the company that has the most benefits and liabilities in it

-must disclose this in the notes as well

## 5. Revenue Recognition

### *Criteria for Revenue Recognition*

1. earnings process substantially complete
2. reasonable assurance of payment
3. transaction cannot be cancelled or revoked

### *3 Times to Recognize Revenue*

1. time of production/construction
2. time of sale
3. time of cash collection

-method selected will not affect total recognition, just timing

### **Sales Method**

-most common method; uses the 3 criteria

-standard method for comparison to other 2 methods

-unearned (deferred) revenue account when not earned yet

### **Long-Term Construction Contracts**

1. % completion method
2. completed contract method

### **Instalment Method**

1. instalment sales method

-when collection will take over a year and significant uncertainty exists

-when cash is collected recognize; other revenue goes to the unearned (deferred) revenue account (liability)

\***gross profit percentage**- gross profit/sales price

2. cash collection method

-when collection is highly doubtful; or when costs are not known at outset

## **6. Miscellaneous Topics**

### **Discontinued Operations**

-if discontinued, all the operating results must be broken out separately and shown as a single figure net of income taxes at the bottom of the IS; net figure is reported before extraordinary items

-to qualify, the item must comprise a component of the company and must be clearly distinguishable

-if being sold, it must qualify for held for sale, which means it will likely happen

-the asset should be recorded at the lower of BV or FV less the cost to sell

-the cash flows must disappear and the company must have no further involvement

### **Extraordinary Items**

-reported at the bottom of the IS net of tax effect and separate from discontinued operations

-must be: material, unusual, infrequent

-must be unusual and infrequent to qualify: rarely occurs

### **Accounting Changes**

-changes in accounting methods are handled retrospectively

-changes in estimation, like depreciation, are recorded going forward

-changes in estimation and principle (depreciation), are handled like changes in estimates

### **Correction of Errors**

-errors for the same year are simply analyzed and adjusted

-nonsystematic errors in adjusting entries (inventory) are self-correcting

-if for prior period, such asset valuation which leads to incorrect depreciation: adjust RE to reflect and acknowledge in notes

-distinguish between effect of error and correction of error; distinguish between adjusting and correcting entries

### **Interim Reporting**

-any period less than a year; usually 3 months

-integral view: should reflect annual expectations

-revenue recognition and expenses matching are the same

-income taxes must be estimated

-temporary declines in inventory are not recognized

### **Segment Reporting**

-assists valuation by breaking down company

-must first identify the distinct segments

3 tests to determine materiality: revenue test, profit and loss test, asset test

-when only 1 segment, must disclose in notes: revenue from external customers, long-lived assets, specific foreign countries, and 10% revenues from a single customer

-can aggregate similar segments based on like products, regulations, or methods

### **Personal Financial Statements and Development Stage Enterprises**

-statement of financial condition (balance sheet)

-statement of changes in net worth (income statement)

-for development stage enterprises, they must report: current period and since inception statements

### **Partnership Accounting**

- many aspects are the same as for corporations; but they have separate capital account for each partner which replaces SE on the balance sheet
- when new partners are admitted, any contributions are recorded by partnership at market value but original book value is maintained for tax purposes; use either bonus or goodwill method
- profits and losses are assigned to each partner's capital account; actual compensation may differ
- liquidations are ordered according to the partner's capital accounts

## **7. Financial Instruments**

- cash, investments in equities, or contracts to receive or pay cash or another financial instrument
- financial instrument can also include: accounts receivable, notes payable, forward currency exchange contracts

### **Derivatives**

- has an underlying asset and a notional amount and a set amount to pay in the future
- the amount of shares is the notional amount and the price of the stock is the underlying
- the net initial investment is often much lower than for other investments
- either require or permit net settlement, or require delivery of the asset
- examples: options, futures, forwards, interest rate swaps, currency swaps, swaptions (options on a swap), credit indexed contracts, interest rate/caps/floors/collars
- can be either assets or liabilities on balance sheet; reported at fair values
- change in fair value is reported within either current earnings or comprehensive income
- \***embedded derivative**- warrant or such; add on
- \***bifurcation**- separating an embedded derivative from its host contract; to account for and sell separately for accurate valuation

### **Hedges**

- derivatives are used to hedge risk
- to qualify as a hedge, the derivative must: be acknowledged at the beginning of its life as so, and must be highly effective throughout its life, using the same effective method

### **3 Kinds of Hedges**

#### **1. fair value hedge**

- for changes in FV of: recognized asset or liability, or unrecognized firm commitment

#### **2. cash flow hedge**

- for variability in cash flows of: recognized asset or liability, or forecasted transaction

#### **3. foreign currency hedge**

- for: unrecognized firm commitment, AFS security, forecasted transaction, foreign investments
- if the derivative does not qualify as a hedge under these 3 situations, then gains and losses must be recognized in current earnings
- must issue separate disclosures for each type of hedge relating to policies and types and nature of for each set of financial statements
- for instruments that are not derivatives, must disclose: FV, can't net with other instruments or derivatives, and cross-referencing of locations if in multiple areas of financial statements

- must also disclose specifics of credit risk when default by other parties is possible
- off-balance sheet risk, which is losses greater than shown, must be acknowledged as well

## **8. Foreign Currency Transactions and Translation**

- 2 different circumstances: companies with foreign subsidiaries; companies with receivables or payables denominated in foreign currency

### **Exchange Rates**

- spot rates and future rates

- \***direct rate**- in US dollars

- \***indirect rate**- in foreign dollars

### **Forward Exchange Contracts**

- agreement to buy or sell a certain amount of foreign currency at some date in the future

- when hedge is for future purchase or sale, gain or loss is not recognized

- when hedge is for current payables or receivables, gain or loss is recognized

- speculative contracts are also recognized immediately; both use the change in the spot rate, similar to changes in receivables or payables

### **Foreign Currency Transactions**

- between transaction date and settlement date, unrealized gains and losses may be recognized

- these gains or losses go to the foreign exchange gain (credit) or loss (debit) account

- at the settlement date the loss or gain becomes realized

- must report the aggregate gain or loss and any significant rate changes, including effect in unsettled foreign currency transactions

### **Foreign Currency Translation**

- purpose is to provide information about economic effects on cash flows and profits

- \***functional currency**- the currency in which the subsidiary primarily generates and expends cash flows; US dollar for US companies (primary economic environment)

- 6 factors to analyze when doubt: cash flows, sales prices, sales markets, expenses, financing, intercompany transactions

- choice is often based on earnings management and management preference

- \***translation**- when sub and parent have different functional currency; all assets and liabilities are translated at current rate

- \***remeasurement**- when sub and parent have same functional currency; monetary assets and liabilities are remeasured at the spot rate

### **1. Current Rate Method**

- when the functional currency is the foreign currency

- assets and liabilities are translated using current rate at balance sheet date

- revenues and expenses are translated at rates in effect at recognition; weighted averages can be used due to practical considerations

- owner's equity accounts are translated using historical exchange rates

- dividends are translated at the historic rate at date of declaration

- using translated figures for RE, NI, and dividends, calculate amount of translation plug for the balance sheet



-plug is reported under other comprehensive income, and parent's share is reported as accumulated other comprehensive income in SE section

## **2. Temporal Method**

-when the functional currency is the reporting currency of the parent

-monetary assets and liabilities are remeasured using current rate at balance sheet date

-nonmonetary assets and liabilities with historical cost balances are remeasured using historical rates at the date the item entered the subsidiary

-owner's equity accounts, like common stock and APIC, are translated using historical rates

-dividends are translated at the historic rate at date of declaration

-RE is brought forward from last year; or it can be plugged with the resulting remeasurement gain/loss

-revenues and expenses are remeasured using a weighted-average exchange rate; those representing allocations of historical balances are remeasured using same historical rates as those on the balance sheets (depreciation)

-the plug amount is reported on consolidated income statement as gain/loss

-the numbers can just be plugged in; little calculation necessary

## **Hyperinflation**

-if cumulative inflation in the country is 100% or more over 3 year period, the foreign currency statements of that subsidiary are remeasured in the reporting current

-the foreign currency will be quickly losing value to the reporting currency; using the current rate to translate balance sheet amounts will give low values for assets and liabilities

-but this usually isn't that bad because real estate prices rise with the currency, so the nonmonetary assets lose little value

## **9. Accounting for Income Taxes**

### **Deferred Tax Theory**

-pretax financial (book) income follows GAAP; taxable income follows Internal Revenue Code IRC

-usually differ so that tax based on GAAP differs from tax based on IRC

-difference comes from deferred tax credits; future tax benefits

### **Tax Return Terminology**

\***taxable income**- income subject to tax based on the tax return

\***taxes payable**- tax liability on balance sheet caused by taxable income; taxable income \* tax rate

\***income tax paid**- actual cash flow for income taxes, including payments or refunds for other years

\***tax loss carryforward**- current net taxable loss used to reduce taxable income (taxes payable) in future years

### **Financial Reporting Terminology**

\***pretax income**- financial statement income before deduction of income tax expense

\***income tax expense**- cash taxes + deferred tax benefit or expense

\***current tax expense (taxes payable)**- cash taxes payable in current period

**\*deferred tax expense**- difference between income tax expense and current tax expense; results from changes in deferred tax assets and liabilities

## Differences

### 1. Temporary

- temporary differences will reverse themselves
- when revenues are recognized in 1 period and tax recognition in another period
- different depreciation methods used on tax return and income statement is most common

**\*deferred tax liability**- when taxable income will be higher than accounting (book) income in the future; fewer taxes now

- examples: accrual accounting for sales for book, but instalment method for taxes; different depreciation methods; equity method for book ,but dividends collected for taxes

**\*deferred tax asset**- taxable income will be lower than book income in the future; future benefits, more taxes now

- examples: estimated warranties, contingencies, and bad debts; cash and accrual accounting at same time

### 2. Permanent

- never create deferred tax assets or liabilities

examples: municipal bond interest and life insurance are included in book income but never in taxable income; federal taxes are expenses on the books but are not deductible for tax purposes; same for life insurance premiums if the company is the beneficiary

- dividends received deduction DRD 70% if < 20% owned; 80% if 20-80 owned; 100% if >80% owned

## Financial Reporting of Income Tax Accounts

- the balance sheet approach is used for recognizing deferred taxes
- for future years, use expected tax rates
- difference between deferred tax assets and liabilities and valuation allowance already on books is the net income tax expense on the income statement
- each item within book income should have a current tax effect, future tax effect, or not tax effect
- increase in tax rates increase deferred tax expense, and decreases in tax rates decrease deferred tax expense; opposite for deferred tax assets
- use the valuation allowance for total aggregation of tax effect; contra asset account to reduce the value of the deferred tax asset
- this valuation allowance can have significant effects on income; can be used as an earnings management tool
- must have future taxable income for deferred tax assets to be beneficial
- management must defend the recognition of all deferred tax assets
- deferred tax accounts will be current or noncurrent based on the account they pertain too
- deferred tax assets and liabilities are netted into 1 on the balance sheet
- disclose all relevant information in the notes

**10. Leases****Capital Leases**

-major goal is to recognize the economic substance of the lease agreement over its mere legal form

## IV. Governmental Accounting

### 1. Governmental Accounting

#### Fund Accounting

- fund accounting emphasizes accountability over profit measurement
- keeps resources segregated in different funds for accounting purposes
- includes local governments, public colleges and universities
- GASB issues the rules for these

#### 7 Major Differences

1. no profit motive; some like utilities do though
2. legal emphasis that involves restrictions both in raising and spending of revenues
3. inability to match revenues with expenditures; revenues often come from persons other than those receiving the services
4. emphasis on accountability or stewardship of resources entrusted to public officials
5. use of fund accounting and reporting; as well as government-wide reporting
6. recording of the budget in some funds
7. use of modified accrual accounting rather than full accrual accounting in some funds

#### Reporting Entity

- 2 parts to a reporting entity: primary government and its component units
- \***primary government**- state, general purpose local, or special purpose local government that has a separately elected governing body, is legally separate, and fiscally independent of other state or local governments
- \***component unit**- legally separate organization for which the elected officials of a primary government are financially accountable; or for which, the nature and significance of their relationships with a primary government is such that omission would cause the primary government's statements to be misleading
- \***discrete presentation**- most component units presented this way; in the government wide financial statements in a separate column to the right of the government primary information
- \***blended**- for component units whose activities are so closely tied to the primary government as to be indistinguishable should be blended with

#### Government Reporting Model

- must include: MD&A (RSI); government-wide financial statements (statement of net assets and activities); fund financial statements (government- BS & IS; proprietary- BS IS CF; fiduciary funds- BS RE); notes to financial statements; other RSI

#### Special Purpose Governments

- include park districts, tollway authorities, school districts, and sanitation districts
- 4 categories: governmental activities, business-type activities, fiduciary activities, both governmental and business-type activities
- depending on what activities the special purpose is engaged in, they will have to prepare their statements differently: only business or fiduciary activities (only proprietary or

fiduciary fund statements); single government activity, cemetery or school (combine government-wide and fund financial statements); multiple government activities and government/business activities (government-wide and fund financial statements)  
 -comprehensive annual financial report CAFR may be included: introductory section, financial section, statistical section

### **Management's Decision and Analysis MD&A**

-purpose is to provide users with an introduction, overview, and analysis  
 -subject to audit; subjective information will likely be included elsewhere

### **Government-Wide Financial Statements**

-include the BS (statement of net assets) and IS (statement of activities); both prepared on the economic resources measurement focus and on the accrual basis  
 -fiduciary activities are not reported because they must reported to outside entities and therefore are of no use to the government

-infrastructure items are fixed assets; capitalized and depreciated

-fixed asset management system must be in place as well

\***statement of net assets:** governmental activities, business-type activities, total primary government, component units

\***statement of activities:** expenses, program revenues, net expense (revenue), general revenues, special items, extraordinary items, transfers, net assets

### **Fund Financial Statements**

-fund financial statements needed in addition to government-wide financial statements

#### ***11 funds in 3 categories***

**1. governmental funds-** focus on current financial resources raised and expended to carry out general government purposes: general fund, special revenue fund, debt services fund, capital project fund, permanent fund

-needs BS and IS

**2. proprietary funds-** focus on total economic resources, income determination, and cash flow presentation: internal service funds, enterprise funds

-needs BS IS and SCF

**3. fiduciary funds-** agency funds, pension and other employee benefit funds, investment trust funds, and private purpose trust funds

-needs BS and RE

-major funds are reported separately and all others are combined

#### ***Major Funds***

-general fund always: governmental or enterprise meeting both:

1. total assets, liabilities, or expenses at least 10% for all funds of that category type

2. . total assets, liabilities, or expenses at least 5% for all governmental and enterprise funds

### **Notes to the Financial Statements**

-basic stuff needs to be included

### **Required Supplementary Information RSI other than MD&A**

-pension schedules, schedule of revenue and claims development, budgetary comparison schedule, infrastructure schedules

### **Financial Reporting Process**

-government-wide statements uses the economic resources measurement focus and accrual basis of accounting

- measures all economic resources available to the government; same things as before
- government fund financial statements use the current financial resources measurement focus and modified accrual basis of accounting
- only current assets and current liabilities (no fixed assets or long term debt); revenues are recognized when earned and readily available for use

### **Accounting for Nonexchange Transactions**

-4 types; normally recognize for exchange transactions (equal value exchanged)

1. derived tax revenues- sales, income, and gas
2. imposed nonexchange transactions- property taxes
3. government-mandated non-exchange transactions- specific money given to government
4. voluntary nonexchange transactions- general money given to government

### **Budgetary Accounting**

-all governments must develop annual budgets

#### ***Government Funds***

1. General Fund- revenue and expenditures cycle
2. Special Revenues Fund-for small special projects
3. Debt Services Fund- for repayment of debts
4. Capital Project Fund- for large infrastructure projects
5. Permanent Fund-revenue fund; large donation by citizen for certain purpose

#### ***Proprietary Funds***

1. Internal Service Fund- between government agencies
2. Enterprise Fund- for public, supported by public; airports, landfills, sanitation

#### ***Fiduciary Funds***

1. Pension, Employee Benefit Funds- when the government is the trustee
2. Investment Trust Funds- similar to external investment pools
3. Private Purpose Trust Funds- all other trust arrangements
4. Agency Funds- when the government is an agent for something

-interfund activities must be accounted for as well: loans, services, transfers, reimbursements

-certain ways specific must be accounted for: leases, long-term debt, and .....

## V. Governmental Non-Profit Accounting

### 1. Not-for-Profit Accounting

-provide socially desirable services without intending to receive a profit

\***private NFP organization**- FASB, resembles for profit

\***public NFP organization**- GASB

#### Financial Statements

1. Statement of Financial Position- permanently, temporarily, or unrestricted net assets
2. Statement of Activities- changes in the 3 types of assets
3. Statement of Cash Flows
4. Statement of Functional Expenses- for voluntary health and welfare organizations
5. Notes to the Financial Statements

#### Contributions

-unconditional transfers of cash or other assets to an entity or the settlement of a liability; must be non reciprocal and are recognized as revenue

#### Contributed Services

-recognized as unrestricted revenue if by specialized skill or creates or enhances non-financial assets; otherwise, it is normal revenue

#### Donated Fixed Assets Including Works of Art

-recorded at FMV as asset with offsetting journal to unrestricted revenue

-does not have to include art or special things if they don't want to

#### Accounting for Certain Investments Held by NFP

-report all debts and equities at fair values

#### Accounting for Health Care Organizations

-same stuff just include a performance indicator section

-revenue is classified as either service rendered or contracts to be rendered

-expenses are decreases in unrestricted net assets

#### Accounting for Colleges and Universities

-may report as special-purpose governmental entities engaged in either business or government type activities

-private follow FASB and public follow GASB

## **IV. Canada/SA/UK/Australia GAAP**



# Management Accounting

1. Costing Concepts
2. COGS/COGM
3. Manufacturing Overhead Allocation
4. Process of Accounting for Factory Overhead
5. Operation Costing
6. Service Cost Allocation
7. Joint Products
8. By-Products
9. Variable and Absorption Costing
10. Variance Analysis
11. Capital Budgeting
12. Present Value and Future Value of Money
13. Capital Budgeting Methods
14. Discounted Cash Flow Methods
15. Capital Rationing in Capital Budgeting
16. Budgeting
17. Transfer Pricing
18. Relevant Information for Decision-Making
19. Marginal Analysis
20. Cost-Volume-Profit (CVP) Analysis
21. Breakeven Analysis when More than 1 Product is Sold
22. CVP and Conditions of Risk and Uncertainty
23. Responsibility Centres and Responsibility Accounting

## 1. Costing Concepts

-fixed, variable, and mixed costs

-as production increases, total variable costs increase, per unit variable and fixed decrease

-fixed remain constant within the relevant range

\***unit contribution**- selling price – variable costs

\***contribution margin**- contribution/sales price

### Product Costs- inventoriable

-carried on balance sheet as inventory then as COGS on income statement when sold

1. materials; direct and indirect

2. labour; direct and indirect

3. manufacturing overhead; fixed and variable

-manufacturing overhead includes indirect labour and materials costs

\***prime costs**- direct materials and labour; direct inputs

\***manufacturing costs**- prime costs and manufacturing overhead applied; no selling or admin (period costs)

\***conversion costs**- manufacturing overhead and direct labour; convert direct materials

### Period Costs

-expensed as incurred

-include selling and administrative costs

### Other Costs

1. opportunity costs

2. carrying costs- anything to keep the inventory; rent, insurance, wages. ....

3. sunk costs- irrelevant

4. committed costs- long-term lease; not yet spent

5. discretionary costs- periodic, must be spent in long run; advertising and R&D

6. marginal costs- to produce 1 more unit

7. engineered costs- has a definite physical relationship to activity base or measure; direct materials

8. imputed costs- does not exist but is needed for decision making; interest rates

-overtime is generally accrued as total manufacturing overhead, unless for a specific job then charged to that job

## 2. COGS and COGM

\***COGS**= BFGI + purchases or COGM - EFGI

-the cost to produce or purchase the units sold during the period

\***manufacturing costs incurred during period**= direct materials and labour used + manufacturing overhead applied

\***COGM**= manufacturing costs incurred during period + BWIP - EWIP

-cost of the units completed and transferred out of work-in-process during the period

-overhead generally refers to anything that can't be exactly traced; manufacturing and nonmanufacturing

### 3. Manufacturing Allocation

#### 3 Main Production Costs

1. direct materials
2. direct labour
3. manufacturing (factory) overhead

#### 3 Factory Overheads

1. indirect materials
2. indirect labour
3. general manufacturing overheads- rent, electricity, utilities

**\*standard, traditional, allocation method-** use a cost driver; direct labour hours, machine hours, materials costs, units of production, weight of production

-each department will use a different base depending on their specifics

**\*manufacturing overhead allocation rate-** budgeted dollar amount/ budgeted activity level

-predetermined at beginning of period

#### *Level of Activity*

1. theoretical, ideal, capacity
2. practical capacity- still too optimistic
3. normal, currently attainable capacity

-will be achieved in the long run; should be used

-will result in higher net income, because more overhead will be allocated to the inventory on the balance sheet instead of COGS on the income statement

-underapplied manufacturing overhead results from higher predetermined rate than actual

-overapplied manufacturing overhead results from lower predetermined rate than actual

#### *Costing Methods*

-direct labour and materials are treated the same under each method

1. standard costing system

-standard or predetermined rate \* standard number

2. normal costing system

-standard or predetermined rate \* actual number

3. actual costing system

-actual costs are used for each unit

### 4. The Process of Accounting for Factory Overhead

-debit the factory overhead control (liability account) and credit cash as the costs are incurred

-then debit WIP and credit factory overhead control- applied

3 inventory accounts: WIP, finished goods, raw materials

3 locations in financial statements: ending WIP, finished goods, COGS

#### **Overapplied and Underapplied Manufacturing Overhead**

-actual costs incurred and/or actual activity level will likely be off

-underapplied results in a debit in OH control (positive)

-overapplied results in a credit in OH control (negative)

#### **Immaterial amounts**

-underapplied is charged to COGS; decreases profit

-overapplied is taken out of COGS; increases profit

### **Material Amounts**

-distributed among the WIP, finished goods, and COGS

-underapplied is added to these accounts and overapplied is taken out of

-underapplied adds to the value or cost and overapplied reduces the value or cost of each item produced during the period

-allocation basis must be determined first; may be multiple allocation bases

### **3 Main Costing Methods**

-after standard or traditional

#### **1. Activity Based Costing ABC**

-focuses on individual activities as the fundamental cost objects; cost drivers

\***activity**- event, task, or unit of work with a specified purpose; designing products, setting up machines, making orders, distributing products

\***cost object**- anything for which costs are accumulated for managerial purposes; specific job, product line, market, customer segment

\***cost driver**- anything that causes costs to be incurred each time the driver occurs; set-ups, moving, casting, number of parts, packaging or handling

-becoming more important because traditional costing usually used labour hours, which are becoming scarcer

-similar to standard allocation, just has more cost pools to choose from

-more difficult to set up, because attention must be paid to each of the cost drivers; so also is more accurate

-must distinguish and separate **non-value adding** and **value-adding** activities

-then must obtain the allocation rate for each cost driver

\***cost pool**- where the manufacturing overhead is collected; for each cost driver; then allocated as the drivers are used in production

#### **Advantages**

1. more accurate product costs
2. can identify non-value adding activities

#### **Disadvantages**

1. not everything can be allocated to a cost-driver; facility-sustaining costs
2. expensive and time consuming

#### **2. Process Costing**

-used when the goods are homogenous or assembly lines; similar production processes (departments)

-allocate all costs to either EWIP or finished goods

#### **Costs come from 3 places**

1. incurred by department during the period; labour
2. transferred in from another department
3. already in department in the form of BWIP

-2 classifications of costs: **conversion costs** and **materials**

-conversion costs include everything except raw materials

-transferred in costs are similar to raw materials; include materials and conversion costs for the finished good from the other department

-all goods go through 3 accounts: EWIP, finished goods, COGS; finished goods + COGS = transferred out

-all costs go into WIP; these costs then have to be transferred to either EWIP or finished goods (COGS) at end of period on a per unit allocation basis

### *Steps*

#### **1. determine the physical flow of goods**

-must know where each physical unit was at the end of the period

\***physical flow**: units BWIP + units transferred in = units EWIP + units completed

#### **2. calculate the number of units started and completed**

-for units of which 100% of work started and completed in the period

\***units started and completed this period** = £ units completed - £ units BWIP

#### **3. determine when the materials are added to the process**

-usually provided; conversion costs are usually added evenly throughout the period

#### **4. calculate the equivalent units produced for materials and conversion costs EUP**

-simply the number of units completely produced; BWIP makes this more complicated

#### **3 Amounts of Work that could Apply to a Unit for EUP**

1. completed- some of the work done in prior period

2. started and completed

3. started- not completed and transferred out

-EUP for materials and conversion costs may be needed separately; may be added in different rates for the same product; but, usually all the materials are added at the beginning and just conversion costs need to be included

-depending on when the materials are added, 50% complete for conversion costs; will create situation where product could be 100% materials complete and 60% conversion complete

#### **EUP FIFO**

-finish units in BWIP before starting any new units

-main difference is the assignment of costs from the last period to units in BWIP

-costs of BWIP go to finished goods or transferred out

\***EUP/FIFO** = completion of BWIP + started and completed + starting EWIP

#### **EUP WAVG**

-costs of BWIP and work done in current period will be averaged

-costs in BWIP will be combined with current period to get an average

-no distinction between units, so none between costs either

\***EUP/WAVG** = units completed + starting EWIP

-EUP under WAVG can never be lower than FIFO; will equal if there was no BWIP

#### **5. calculation of costs incurred during the period for materials and conversion costs**

-difference between FIFO and WAVG is only for BWIP; all other costs are handled in same manner

-all BWIP costs are transferred directly to finished goods under FIFO; only costs allocated to EUP are those actually incurred in the period; best to use when there are price changes between periods

-WAVG will add together the BWIP with the other costs; best to use when prices are stable

#### **6. calculation of the cost per EUP**

=step 5/4

-total costs incurred / EUP for both materials and conversion costs

-rates for materials and conversion costs must be calculated separately because EUP for both may be different

### **7. allocation of the costs to the products; EWIP and transferred out**

-allocate costs to finished goods and EWIP based upon number of units in EWIP and FG  
-usually easiest to allocate costs to EWIP and then to FG; in FIFO, do not forget to allocate costs in BWIP to FG

### **Spoilage in Process Costing**

-defective units not transferred to the next process  
-becomes an additional step in EUP, as spoiled units received some costs; depends on when they are identified as spoiled  
-similar to another EWIP, because they are not transferred to the next step  
-now units can go to EWIP, FG, or spoilage  
-EUP for spoilage for conversion costs depends on when the inspection takes place; halfway through or at the end (gets full cost credit)  
-EUP for spoilage for materials depends on when the materials are added  
-allocating the costs will likely be done separately for conversion costs and materials  
-where the costs are transferred depends on whether the spoilage is normal or abnormal  
-for normal spoilage, the costs for spoiled units are added to the good units transferred to the next step; therefore, cost per unit transferred in next step is higher than cost per unit to produce in current step  
-abnormal spoilage is expensed on the income statement as loss from abnormal spoilage  
-only final inspection will transfer spoilage costs to COGS; all other inspections will add them to the units produced  
-abnormal spoilage is considered to be preventable and should not occur

### **3. Job-Order Costing**

-costs are accumulated on job-cost sheets, not inventory accounts  
-all job-cost sheets open equal the WIP  
-labour and materials are assigned to each job, but manufacturing overhead is allocated to each job; using standard or actual costing rates  
\***extended normal costing**- direct costs (materials and labour) are also allocated by using a standard rate \* actual usage  
-period costs are still expensed on the income statement

### **5. Operation Costing**

-combination of job-order and process costing  
-used for different batches of products when the direct materials are different  
-direct materials are allocated to each batch, but conversion costs are accumulated and distributed using a predetermined conversion cost per unit; conversion costs are allocated by batch

### **Backflush Costing**

-all costs are accumulated during the period and distributed when the product is sold or finished  
-cheaper and easier alternative to use; when products produced have a standard cost that is easily applied

- used with JIT, because JIT has low levels of inventory so backflush shortcomings are not as pronounced
- no distinction made between raw materials and WIP; “raw and WIP” “conversion costs”
- still transferred to finished goods at the end and any differences between standard and actual costs are closed to COGS

## 6. Service Cost Allocation

- are essentially the nonmanufacturing overheads; cafeteria, quality control, power, service
- must be transferred to the products produced
- main issue arises when people from different departments use the services

### 3 Methods of Allocation

#### 1. Direct Method

- reciprocal services provided by each department to each other are ignored
- get different ratios for usage by each department and allocate based on a driver
- simplest and most common method

#### 2. Step Method

- service departments receive costs from each other, as well as disperse costs to the other production departments
- must be an order to allocate service departments; highest % to the other's is allocated first; then next highest

#### 3. Reciprocal Method

- most complicated; allocates costs between the service departments as well as production departments
- uses simultaneous or reciprocal equations to solve

## 7. Joint Products

- 2 products share the same production process up until a **splitoff point**
- main issue is the allocation of the **joint costs** to the different products
- costs incurred after the splitoff point are **separable costs**

### 4 Methods

#### 1. physical-unit method

- joint costs are allocated based on the actual physical units produced; can also use other physical measures such as weight or volume

#### 2. relative sales value at splitoff method (gross market value method)

- essentially same as the NRV method
- = sales value of product X/ total sales value of joint products \* joint costs

#### 3. estimated net realizable value NRV method

- joint costs allocated based on the NRV of the 2 products
- \*NRV= sales price of items produced to be sold in the future – separable costs incurred after splitoff point
- if 1 product is not processed further after splitoff point, must use the relative sales value at splitoff method

#### 4. constant gross margin % NRV

-allocates the joint costs so all products have the same gross margin %

## **8. By-Products**

-main issue is the accounting for costs and revenues associated with these

### **2 Methods**

#### **1. Inventory the By-Product costs**

- by-product recognized at time of production
- sales revenue received is treated as a reduction of the costs of the main product
- usually selected because by-product revenues are usually small; if not, joint-product

#### **2. Revenue from the By-Product**

- by-product recognized at time of sale
- will be an inventoriable cost of production, revenue and some profit or loss on the sale
- joint costs are sunk costs in the decision to process further or sell immediately
- firm must compare incremental revenues with incremental costs

## **9. Variable and Absorption Costing**

- 2 different ways of determining the cost of production and presenting the IS
- all other costs except for fixed factory overheads are treated the same, but may be presented differently on the IS
- US GAAP and IAS require absorption costing for external reporting; but, variable is better for internal analysis purposes

### **2 Differences**

#### **1. treatment of fixed factory overhead costs**

- rent, insurance
- under variable (direct) costing, fixed factory overheads are a period cost expensed in period incurred; no matter the level of sales; not a variable cost
- under absorption costing, fixed factory overheads are allocated to the units produced during the period using a predetermined rate; product cost

#### **Effects of Changing Inventory Levels**

- differences between the methods arise when there are inventory level changes during the period, meaning level of sales did not equal production
- if production is greater than sales, then income calculated under absorption method is greater
- if production is less than sales, then variable method will give greater income
- the difference will not present itself in the long run

#### **2. IS presentation**

- under absorption costing, calculate a gross margin by revenue – COGS (fixed and variable manufacturing costs)
- under variable costing, we get a contribution margin by subtracting variable manufacturing costs
- when there is no BI, difference in income is just fixed overhead cost per unit \* £ of units of change in inventory



## 10. Variance Analysis

- process of comparing actual expenses and revenues to budgeted amounts
- standard cost is created at the beginning of the year on estimates
- standard cost system can be used with either a process or job-order costing system
- standard costs are best used with a flexible budget system; standard costs \* actual level of output
- costs are the results of activities, so cost drivers must be used
- can use ideal, practical, or normal output levels; if set too high will be no motivation because is impossible to reach

**\*master budget capacity**- planned capacity for the next budget period

### *Sources of Standards*

1. activity analysis
2. historical data
3. benchmarking
4. target costing- target prices
5. Kaizen- continuous improvement
6. strategic decisions

### **I. Direct Materials Variances**

**\*total material, flexible budget variance**- actual direct material costs- standard direct materials costs (flexible budget)

- for actual production levels; 2 parts; can be favourable or unfavourable
- either paid a different materials cost or used a different amount of budgeted materials

#### **1. price variance**

$$= (SP - AP) * AQ$$

#### **2. quantity or usage variance**

$$= (SQ - AQ) * SP$$

### **II. Direct Labour Variances**

**\*total labour, flexible budget variance**- actual direct labour costs – standard direct labour costs (flexible budget)

- either paid a different wage rate or used different than budgeted amount of labour hours

#### **3. rate (price) variance**

$$= (SP - AP) * AQ$$

#### **4. efficiency variance**

$$= (SQ - AQ) * SP$$

### **III. Factory Overhead Variances**

- more difficult to see; 4way 3way or 2way analysis

#### **5. total variable overhead, flexible budget variance**

= flexible budget amount – actual variable overhead incurred

##### **5a. variable overhead spending variance**

$$= (SP - AP) * AQ$$

##### **5b. variable overhead efficiency variance**

$$= (SQ - AQ) * SP$$

#### **6. total fixed overhead variance**

= applied fixed overheads (standard rate \* standard output) – actual fixed overhead

##### **6a. fixed overhead budget variance**

= budgeted fixed overheads (static budget amount) – actual fixed overhead

**6b. fixed overhead production, volume variance**

=applied fixed overhead – budgeted fixed overheads (static budget amount)

**IV. Sales Variances**

-use **standard contribution margin per unit** instead of sales price because fixed costs remain constant; contribution = sales price – variable costs

-if a flexible budget is used to compare actual results, no sales volume variance will exist because actual will equal budgeted sales; must use static budget

**\*total sales variance** = actual – budgeted contribution

**7. sales price variance**

= (AP – SP) \* AQ

-using contribution per unit

**8. sales volume variance**

= (AQ – SQ) \* SP

**11. Capital Budgeting**

-capital budgeting focuses on the entire life of the project; life-cycle approach; cradle to grave

-utilizes the incremental (from that project) and differential (between 2) cash flow approaches

-utilizes different sales and quantity combinations

**4 Major Methods**

1. NPV
2. internal rate of return
3. payback method
4. accrual accounting rate of return method

**Terms**

-avoidable costs, committed costs, common costs, cost of capital, deferrable, discretionary costs, differential revenue, costs, and cash flows; fixed and imputed costs, incremental revenues, costs, and cash flows; relevant revenues, costs, and cash flows; sunk costs

**Taxes**

-some tax concessions will arise; may not be the same for state and federal

**12. Present Value and Future Value of Money**

**\*annuity in arrears, ordinary**- payments due at the end of the period

-tables are for ordinary annuities

**\*annuity due**- payments made at the start of the period

-PV of annuity due- table value for ordinary annuity for 1 less period + 1

-FV of annuity due- table value for ordinary annuity for 1 more period - 1

**Cash Flows**

-the relevant cash flows are important; for accrual method use relevant accounting incomes and expenses

-any increases in working capital are reduction in inflows; in final period, release of working capital is a cash inflow

**1. Beginning**

- A. initial investment- no immediate tax effects; depreciation over life of the asset
- B. initial working capital investment- no tax effects
- C. salvage value from old machinery- tax gain or loss; loss is a positive inflow

**2. Annual, ongoing*****Inflows***

- A. increased sales
- B. decreased operating expenses
- must pay taxes for both

***Outflows***

- C. follow-up investment; tax effect from depreciation
- D. further working capital investment; no tax effect

**Tax Depreciation Shield**

- most difficult recurring cash flow over the life of the asset
- MACRS will be a different rate each year; \* this times full cost of the asset; do not include residual or salvage value
- \***depreciation tax shield**= cost of the asset \* MACRS depreciation % \* marginal tax rate
- will reduce taxable income, so will not be an inflow, but will reduce outflows; so treated as a cash inflow

**3. Disposal or Completion**

- A. cash received from disposal of equipment- gain or loss based on BV accordingly
- B. recovery of working capital- no tax effect
- could be other tax considerations as well, such as concessions or reliefs
- will be irrelevant cash flows as well; sunk costs and dispersed overhead costs

**13. Capital Budgeting Methods**

- can be a screening or ranking method

***4 Screening Methods***

- determines whether or not it is a good method
- 1. Payback Period
- 2. NPV
- 3. internal rate of return
- 4. accounting rate of return

***1 Ranking Method***

- 1. Profitability Index

**Payback Method**

- to determine the number of periods before the net after tax cash flows equals the initial investment cost
- just determine where the inflows equal the outflows; pick a time period
- can provide an indication of liquidity and manage risk in unstable environments

***Advantages***

- 1. simple and easy to understand
- 2. preliminary screening
- 3. useful when expected cash flows in later years are uncertain
- 4. for high technology investments; when the technology becomes obsolete quickly

**Weaknesses**

1. ignores all cash flows beyond the payback period
2. does not incorporate the time value of money
3. ignores the cost of capital

**Discounted Payback Method**

- breakeven time
- incorporates the time value of money into payback period method
- will result in longer return time

**14. Discounted Cash Flow Methods**

- screening methods
- cash flows received earlier are worth more
- focus on actual cash inflows and outflows rather than income (accrual) as the measurement basis

**2 Methods****1. NPV method**

- discounts all inflows and outflows to the present period using the required rate of return
- \*required rate of return-** same as the market; minimum required for the firm; discount rate, hurdle rate, opportunity cost of capital; usually the firm's WACC
- for risk premium to remain the same: 1) new assets must not change operating environment 2) new capital must be raised in same proportions
- must be appropriate to the risk of the project; must be positive or 0
- assumes cash inflows will be reinvested at the hurdle rate
- tax depreciation shield, sale of assets, working capital released, and gains and losses
- depreciation is a non cash expense, but it does have a cash flow impact
- to account for risk of future cash flows, use a higher rate of return; lowers the NPV
- gives us an actual dollar amount, not a project rate of return
- initial investment is not discounted, but subsequent investments are

**2. Internal Rate of Return IRR**

- interest rate at which the NPV is equal to 0
- PV of outflows equals PV of inflows
- if higher than required rate of return accept, if lower, do not accept
- assumes reinvestment at the IRR rate of interest
- modified IRR fixes this, assumes reinvestment at cost of capital rate
- can give multiple answers, such as when cash flows change from positive to negative

**Accounting Rate of Return**

- called unadjusted rate of return model, because does not incorporate time value of money
- since it used accrual accounting income, includes depreciation
- ratio of the amount of the increase in accounting income to the required investment
- = increase expected annual after tax accounting net income / net initial investment
- similar to IRR in that it is a rate of return, but focuses on accrual net income, not cash flows, and no time value of money; IRR is better

**Capital Budgeting Decisions**

- ranks the profitable projects against each other

**Profitability Index**

- excess PV index
- is a benefit/cost ratio
- if is 1 or greater, the NPV is positive and project is acceptable; if PI is <1, NPV is negative
- expresses profitability on a % basis, not dollar amount
- when projects are independent and have same initial amounts and time, will give correct decision; otherwise, NPV is better

**2 Methods**

- will give same result if there are no negative cash flows besides year 1
- A. = PV future net cash outflows and inflows / net initial investment
- B. = PV of future net positive cash flows / net initial investment + PV future cash outflows
- just add the negative cash flows to the denominator
- can have scale differences, cash flow differences, and life span differences to control for
- if projects are dependent or contingent must be considered with each other

**Generalizations**

1. NPV and PI will usually agree; any disagreement is between them and the IRR; use NPV
2. NPV and PI will conflict when there are scale differences; PI and IRR will agree; use NPV to maximize shareholder's wealth and IRR to maximize return

**15. Capital Rationing in Capital Budgeting**

- will usually be the case
- when it is present over several periods, use linear programming
- if capital rationing is only for the current period, PI is sufficient
- the coefficient of variation of the probability distribution of project outcomes can be used to compare riskiness
- whenever all profitable projects are not selected, not maximizing productivity; but this cannot always be the case

**16. Budgeting**

- use participative budgeting; bottom-up budgeting
- upper management still must set the goals and organize
- budget manual must include the communication and distribution process
- use a planning calendar

**5 Types of Budgets****1. Sales Budget**

- done first so firm knows how many units to produce
- each department or sales person individually; most difficult to estimate because it relies on outside estimates
- based on forecasted sales level, objectives, production capacity, credit sales and collections

**2. Production Budget**

- to determine where inventory will be at year's end
- includes when the units will be produced; take into account changing prices
- provides foundation for: direct labour and materials budgets, factory overhead, and ending inventory budget

### **3. Direct Labour Budget**

- influenced by outside parties like labour unions
- include all other employee costs including salaries; employee benefit statement
- must determine how to treat employee costs; period, direct labour, or overhead cost

### **4. COGS Budget**

= BI + budgeted purchases or production – EI

- all expense budgets will be broken down into fixed and variable costs
- other budgets to complete the budgeting process: R&D, selling and marketing, administrative and general, other expenses, capital budget

### **5. Cash Budget**

- cash management and working capital budget
- done last
- same reason pro forma statement of cash flows is the last developed
- allows the firm to predict cash shortfalls and invest excess cash
- particularly for seasonal firms

### **Operating and Financial Budgets**

- can now create the pro forma financial statements

**\*operating budget-** includes: individual operating budgets, sales, production, purchasing, marketing, R&D; pro forma income statement and supporting documents

- always done first

**\*financial budget-** part of master budget; pro forma balance sheet, cash flows, and capital budget

### **1. Capital Budget**

- expenditures for PPE
- for years on out; but any acquisitions for the next period must be identified

### **2. Master Budget**

- all of the documents and statements together

### **3. Flexible Budget**

- fixed or static budget; prepared for 1 level of activity
- more useful is the flexible budget; used for standard cost system
- leaves fixed costs the same and changes variable costs per unit
- flexible budget must be adjusted for actual volume before comparing actual to budgeted results; this difference is the flexible budget variance; measures efficiency of the firm

### **Other Budgets**

#### **1. Zero-based budgeting**

- develop without any reference to current budget situation; more difficult and time consuming, but can be beneficial because it requires justifying all expenses
- differs from incremental budgeting where alter current period results
- can identify non-value adding activities better

#### **2. Life-cycle budgeting**

- follows a product through its entire life; development to decline
- the firm can pinpoint cash flows better

**3. Activity-based budgeting**

-similar to activity based costing; identify activities that are cost drivers

**4. Kaizen budgeting**

-takes into account expected continuous improvements

**5. Continuous budgeting**

-rolling budget; 1 year out from end of year

**6. Project budgeting**

-everything for a specific project

**Budget Reports**

-compared throughout the year for favourable or unfavourable variances

-part of the control loop, the process by which activities are monitored

**Control Loop Steps**

1. establish the budget or standards
2. measure the actual performance
3. analyze and compare results
4. investigate unexpected variances
5. devise and implement corrective actions
6. review and revise standards

**17. Transfer Pricing**

-price charged by 1 unit of the company to another unit for the services or goods produced by the first and sold to the 2<sup>nd</sup>

**\*profit and investment centres**- use transfer pricing to calculate costs and profits when products with outside markets are sold to other departments

-most common in vertically integrated firms; several different value-creating operations for a product

**\*cost centre**- works on pure cost basis; transfer price is the costs incurred only

-must be goal congruence for transfer pricing to work; tax minimizations

-top management set the guidelines

**Methods****1. market price**

-same price as for an arm's length transaction; best when there is an external market

**2. cost of production + opportunity cost**

-outlay or production cost + contribution lost by selling internally

**3. full cost**

-includes all fixed and variable cost; uses absorption costing; can lead to bad decisions since it includes fixed costs

**4. variable cost**

-decreases profitability, but works well when seller has excess capacity for internal demand

**5. cost plus**

-attaches a fixed dollar amount or % to production costs; if standard costs are used, then there is need to separate out variances; if actual costs are used, then they are just passed on to the next department

-US government uses these

## 6. negotiation

-works well when there are changes in prices of materials or when there are conflicts

**\*dual-pricing**- recording different amounts in the books; can't be good

-management must consider: goal congruence and production capacity

## 18. Relevant Information for Decision-Making

-revenues and costs are relevant if they: occur in the future (not past, or sunk); differ among the alternatives

### 1. Incremental and Differential costs

**\*incremental**- occur additionally as a result of an activity; old machine or new one

**\*differential**- differ between 2 alternatives; 2 new machines

### 2. Avoidable and Unavoidable costs

### 3. Opportunity costs

-only exist if there is a constraint on the resources

## 19. Marginal Analysis

-incremental analysis; focus only on relevant cost, not total profits or revenues

-total costs are irrelevant, because they include fixed costs; only variable costs are relevant

### 5 Situations

#### 1. Make-or-Buy Decisions

-insourcing v. outsourcing

-consider variable and avoidable fixed costs

-what is the maximum price a firm will pay from an outside supplier

= total internal production costs – unavoidable fixed costs – unavoidable variable costs

-qualitative issues will arise as well, such as reliability and quality

#### 2. Accept or Reject 1 Time Offer

-same as before

-variable overhead is usually considered an avoidable cost in both decisions

### Operating Capacity

-these decisions are also affected by operating capacity

-if at less the full capacity, then only the avoidable differential costs must be included in minimum price charged for the order; qualitative concerns as well, such as loss of goodwill from other customers for not getting same discounts

-if at full capacity, then must also consider opportunity cost loss

#### 3. New Products or Changes in Output

#### 4. Adding or Dropping Product Lines or Divisions

#### 5. Selling or Processing Further

-based on incremental accounting income attainable past as-is point

-encountered when dealing with joint costs or obsolete inventory

### Joint Costs

-joint costs are sunk costs

-only relevant costs are incremental from processing further and the increase in net operating income



**Obsolete Inventory**

- book value becomes a sunk cost
- only relevant costs are incremental costs and revenues from reworking it or disposal or selling it as is
- tax effects of the loss are based on the book value

**Disinvestment Decisions**

- some of the fixed costs still may not be avoidable

**4 Steps**

1. identify common fixed costs
  2. calculate total variable costs
  3. determine avoidable costs
  4. determine whether the division will be able to generate the required revenue
- many qualitative considerations to consider as well

**20. Cost-Volume-Profit (CVP) Analysis**

- breakeven analysis
- used for short-run decision making
- calculates changes in profitability from product mix and quantity sold
- examines relationship volume has with costs, revenue, and profit
- variable costing works best for CVP analysis

**Assumptions**

- in the real world these usually do not hold
1. all costs are either variable or fixed costs
  2. total costs and revenues are predictable and linear
  3. fixed costs remain constant
  4. unit selling price is constant over the relevant range; sales mix remains constant
  5. unit variable costs remain constant over the relevant range
  6. finished goods and WIP do not change
  7. time value of money is ignored

**Contribution Margin**

- based on fact there are 2 costs: fixed and variable; and fixed are constant within the relevant range, so variable or contribution, is what matters
- tells us how much is left to cover fixed costs

\***unit contribution margin**- selling price per unit – variable costs per unit

\***total contribution margin**- unit contribution margin \* £ units sold

\***total contribution margin**- total revenue – total variable costs

**Contribution Margin Ratio**

- contribution margin expressed as a % of sales price

\***contribution margin ratio**- contribution margin per unit / selling price per unit

\***contribution margin ratio**- total contribution margin / total revenue

**Contribution Margin Income Statement**

- revenues – variable costs = contribution margin – fixed costs = operating income

**Breakeven Analysis**

- what level of sales is needed to cover costs

**2 Methods**

**1. Equation Method**

\*OI= quantity \* contribution margin – fixed costs

\*OI= revenues – variable costs – fixed costs

-do include depreciation for a single department, but not period costs unless stated

**2. Contribution Margin Method**

-calculates the breakeven point in £ of units or dollars

\***BEP units**= fixed costs / unit contribution margin

\***BEP dollars of revenue**= total fixed costs / contribution margin ratio

**Profit Requirement**

-can be a total dollar amount or a % of total sales

-firms will have a profit goal

**Specific Dollar Amount Profit Requirement**

-treat profit as an additional fixed cost

**Profit as a % of Sales**

-treat profit as an additional variable cost

**Specific Dollar Amount of After-Tax Profit**

-first get target pre-tax income from given after-tax income

-pre-tax income becomes a fixed cost, not total profit

\***target pre-tax income**= target after-tax income / (1-tax rate)

\***target profit-volume in units**= fixed costs + target pre-tax income / contribution margin per unit

\***target profit-volume in \$**= fixed costs + target pre-tax income / contribution margin ratio

**Specific % of Revenue as After-Tax Profit**

-same way as before

**Break-Even Analysis in Decision-Making**

-can either increase advertising or cut sales price to increase sales

**2 main decisions****1. increase fixed marketing costs to increase sales**

\***BEP**= present fixed costs + new fixed costs + required profit / contribution margin per unit

-will increase the breakeven point; if can sell more than this, do it

**2. reduce sales price to increase sales**

-get a reduced contribution margin

-in the long-run , all costs are variable costs

-use sensitivity analysis for CVP

**21. Breakeven Analysis when More than 1 Product is Sold**

-must assume constant sales mix

-may be breakeven quantity or breakeven revenue

**Sales Quantity Mix**

-get the weighted average contribution margin

- in reality, there is no single breakeven point because the breakeven point depends on the sales mix; there can be different mixes that lead to the breakeven point
- determine the contribution from each product and get the % for each to add up to 100

### **Sales Revenue Mix**

- instead of the weighted average contribution margin, get the weighted average contribution margin ratio for the product mix

### **Effects of Changes in Sales Mix**

- changes in sales quantity or revenue mix
- if sales mix changes, total income can change even if revenue doesn't because of contribution margins
- when the sales mix changes, so does the breakeven point
- if products with higher contribution increase, breakeven decreases
- if products with lower contribution increase, breakeven increases

## **22. CVP and Conditions of Risk and Uncertainty**

- since it involves assumptions about the future, includes risk and uncertainty
- \***risk**- the probability that an outcome has been predicted correctly
- \***uncertainty**- no basis to draw a conclusion 1 way or another

### **Sensitivity Analysis**

- 1 way to deal with uncertainty; asks "what if"
- utilizes the safety margin to get breakeven point
- difference between budget and different amount

### **Expected Value**

- when you have several different outcomes, use the expected values of each
- just assign % weights to the different outcomes and \* quantitative outcomes

### **Deterministic Approach**

- just select the level of output or sales that is most likely and use that
- easier, but not as accurate; doesn't consider variables

## **23. Responsibility Centres and Responsibility Accounting**

- any part, segment, or subunit of an organization; segments may be product lines, geographical area, or any meaningful part
- \***responsibility accounting**- measures accounting results of each responsibility centre separately; used to measure consolidated results
- each one makes a budget; then all sales budgets are consolidated from all responsibility centres
- enables better evaluation and analysis; unit for performance evaluation
- can be difficult to categorize in real life; anything can have a ROI
- feedback is the main link between planning and control; must be timely manner
- must make distinction between performance of manager and their business unit
- focus only on those factors the manager can control; unit performance is part of, not all of
- contribution margin will usually be something under the manager's control

- must segregate controllable and noncontrollable costs
- should focus on information and knowledge more than control; should identify who knows the most about the system or an issue

#### **4 Types**

##### **1. Cost Centre**

- responsible only for the occurrence of costs; have no revenue, and no profit
- least complex; efficiency of operations is important
- equipment maintenance department, internal accounting department, service centres

##### **2. Revenue Centre**

- opposite of cost centre; only has revenues
- effectiveness of operations is most important
- sales departments; any costs will be immaterial and may just be allocated to them

##### **3. Profit Centre**

- responsible for both revenues and costs
- both efficiency and effectiveness are important
- department within a store; revenues and COGS

##### **4. Investment Centre**

- most like a company by itself
- has revenues, costs, and investments
- branch office
- effectiveness is important; so is return-on-investment
- preferable for the firm to have as many investment centres as possible

#### **Allocation of Common Costs**

- those shared by 2 responsibility centres
- method of cost allocation should be : fair, motivating, and provide incentives
- must ensure all of the costs are allocated to the production departments

#### **Methods**

1. cause and effect systems
2. budgeted revenues or contribution margins- for central costs; biggest departments get the most costs
3. based on actual sales- could hurt those that sell a lot; absorb costs

#### **2 Ways**

##### **1. stand-alone costs**

- proportional allocation based on actual usage
- most fair and most commonly used

##### **2. incremental costs**

- has a primary user and secondary users
- allows better chance for survival for new offices
- management by objectives can be a good tool; permits self direction of decision making
- can lead to suboptimization, where the goals of the department differ from those of the firm

#### **Contribution Income Statement Approach to Evaluation**

- segment margin is equal to sales – all fixed and variable costs

\***profit margin ratio**= NI / revenue

Net revenues –

Variable manufacturing costs =  
**Manufacturing contribution margin** –  
Variable nonmanufacturing costs =  
**Contribution margin** –  
Controllable fixed costs =  
**Controllable margin or short-term segment manager performance** –  
Noncontrollable, traceable (allocated) fixed costs =  
**Contribution by strategic business unit or segment performance** –  
Untraceable, common costs =  
**Operating income**

## CMA

### Performance Measurements

-variance analysis is comparing budgeted to actual

#### **Standard costs**

-estimate of the cost the company expects to incur in the production process

-calculated at beginning of year and based on estimations

-good with a flexible budgeting system

-theoretical, practical, and normal output levels

-activity analysis, historical costing, benchmarking, target costing (kaizen); management by exception

#### **Variances**

-different amount used or different price paid

\***total static budget variance**- master budget variance

\***total flexible budget variance**- difference between actual and flexible

\***total sales volume variance**- difference between flexible budget and static budget

### Direct materials variances

\***total material variance**- flexible budget variance- difference between actual and standard costs of amounts used

\***price variance**-  $(SP - AP) * AQ$

\***quantity variance**, efficiency or usage variance-  $(SQ - AQ) * SP$

-purchase price variance includes all materials purchased

### Direct labour variances

\***total labour variance**- flexible budget variance- difference between actual and standard costs of labour used

\***labour rate variance**-  $(SP - AP) * AQ$

\***labour efficiency variance**-  $(SQ - AQ) * SP$

#### **More than one input**

-price variances are just added together

-calculate total quantity and efficiency variances for volume

\***mix variance (material or labour)**-  $(WASP - WAAP) * AQ$

\***yield variance (material or labour)**-  $(SQ - AQ) * WASP$

### Factory overhead variances

#### *Variable overhead variances*

\***total overhead variable variance (flexible budget variance)**= flexible budget amount  
- actual variable overhead incurred

\***variable overhead spending variance**=  $(SR - AR) * AQ$

\***variable efficiency variance**=  $(SQ - AQ) * SR$

***Fixed overhead variances***

**\*total fixed overhead variance**= applied fixed overheads – actual fixed overhead incurred

-applied fixed overhead= standard rate \* standard for actual output

**\*fixed overhead production-volume variance**= applied fixed overhead – budgeted fixed overhead (static budget amount)

**\*spending (or fixed overhead budget) variance**= budgeted fixed overhead- actual fixed overhead incurred

-3 way analysis combines the 2 spending variances

-2 way analysis has fixed overhead volume variance and controllable variance, which is the other 3

**Sales variances**

-sales where higher or lower or prices were higher or lower

**\*total sales variance**= total budgeted – total actual contribution

**\*sales price variance**= (ACM – SCM) \* AQ

**\*sales volume variance**= (ASV – BSV) \* SCM

**More than 1 input**

-when more than one product, all together individually for price, volume broken down

**\*sales mix variance**= (WAbCMaSM – WabCMbSM) \* TQa

**\*sales quantity variance**= (TQa – TQb) \* WACMb

**Market variances**

-explains sales quantity variance

-market was bigger or smaller or market share was bigger or smaller

**\*market size variance**= (actual – expected market units) \* expected share % \* standard weighted average CM per unit

**\*market share variance**= (actual – expected market share) \* actual market size in units % \* standard weighted average CM per unit

-just know what they are, not how to calculate

**Productivity measures**

-the higher the number, the more productive we were

**\*partial productivity**= number of units of output/ amount, or cost, of one input

**\*total productivity**= number of units of output/ amount, or cost, of all inputs

-we are measuring productivity over time by looking at 2 periods

**Quality**

-internal and external customers; they make the final decision on quality

**\*design quality**- doing what the customer wants it to

**\*goalpost conformance**- must be within the acceptable range; zero- defect conformance

**\*absolute quality conformance**- no range, just one acceptable point

-costs, quality, and time are the critical factors in successful strategies

**Costs of quality****1) Cost of conformance**

**\*prevention costs**- to prevent the defects from occurring  
 -information systems, quality training, maintenance, supplier training

**\*appraisal costs**- to determine if unit is defective

-testing, inspection, audits, quality control

**2) Cost of nonconformance**

**\*internal failure**- problem detected before shipment

-rework, scrap, retooling, downtime, expediting costs

**\*external failure**- problem not detected before shipment

-warranty, product liability, environmental, loss of goodwill

-opportunity costs in time spent fixing and lost sales; design quality costs

**\*process quality control**- feedforward to prevent defects from occurring

**\*product quality control**- feedback to identify defects

-reduction in defective units (hidden factory); more efficient manufacturing process;  
 commitment to doing it right the first time—all increase productivity

-positive relationship between quality and productivity

**TQM**

-produce correctly the first time

-organizational action with continuing education

-internal and external customers; quality circles; everyone accountable

-3 year plan

**Measuring quality**

**\*quality cost indices**= total quality costs/ direct labour costs

-people time involved

**\*manufacturing cycle efficiency**= value added production time/ manufacturing cycle time

-manufacturing time involved

-short response time and development time; cycle time includes order receipt and delivery and manufacturing

**Monitoring quality**

-to identify quality problems:

**1) control chart**

-samples operations at regular intervals; statistical control

**2) histogram**

-bar graph representing frequency

**3) pareto diagram**

-ranks histogram data; 20 to 80

**4) cause-and-effect, Ishikawa diagram-**

-fishbone diagram; 4 m's: machines, materials, methods, and manpower

-TQM and ABC work together



- Malcolm Baldrige National quality awards- customer satisfaction most important
- ISO gives targets, not specifications; quality the same throughout
- benchmark to gain a competitive advantage

### Responsibility centres

- any part, segment, or sub-segment of an organization
- consolidate all the responsibility centres budgets to get the master budget
- unit for evaluation- department and manager
- 1) cost centre- least complex, no revenues or profits; accounting or maintenance departments; efficiency important
- 2) revenue centre- just revenues, not many costs; effectiveness is key
- 3) profit centre- revenues and expenses; efficiency and effectiveness; department within a store
- 4) investment centre- profit plus investments; branch office; effectiveness important
- feedback is the main link between planning and control
- contribution is usually under a manager's control
- should focus more on knowledge and information than on control

### **Common costs**

- those shared by multiple responsibility centres
- allocation based on cause and effect system, budgeted revenue or contribution, or actual sales
- allocate a % of contribution instead
- 1) stand-alone cost allocation method- each is charged proportionately; like the above examples
- 2) incremental cost allocation method- a primary centre and incremental centres; better for start-up departments
- MBO requires a lot of communication, otherwise, sub-optimization can occur
- \***controllable margin**, short-term segment manager performance
- \***non-controllable, traceable fixed costs**- short term
- \***contribution by SBU, segment margin**- each centre individually, long term  
= sales – all variable and fixed costs
- \***non-controllable, untraceable**- can't be traced to any centre
- \***profit margin ratio**= net income (profit) / revenue (sales)

### Performance measurement

- 1) **ROI**- key performance measure for an investment centre  
= Net income / average total assets or investment  
-use working capital + fixed assets for total assets  
= Net income / shareholder's equity  
-use when the decision are outside of the manager's control  
-measure % not \$; use current market value to value assets;
- \***Dupont equation**-  $ROA = \text{net income after interest and taxes} / \text{avg. total assets or investment}$
- \***ROA** = profit margin \* asset turnover ratio
- \***profit margin**= net income after interest and taxes/ sales
- \***asset turnover**= sales/ avg. total assets or investment

**2) RI**= net income before taxes on project or investment opportunity- target return in dollars: a % of assets or invested capital

-measures amount \$ of return provided by a department

-use WACC if targets are not given

-just gives dollar amount

**\*imputed, opportunity cost**= target rate of return \* invested capital

-risk rates can be adjusted per department

-not good for comparing units of different sizes

**3) EVA**-more developed version of RI

=operating income after taxes- (book value of current assets – current liabilities) \*

WACC

-helpful because it incorporates the WACC

-can improve by increasing earnings or decreasing capital used

-doesn't measure PV of future cash flows

**\*WACC**= interest paid – taxes + dividends / fair value of debt + shares outstanding

**4) MVA**

=current market value of securities( stocks and bonds) – market value of equity and debt

-higher the better, positive means they have created wealth

-does not take into account opportunity cost, can't be used for private firms, and can't be calculated at business unit level

-different accounting methods will give different values for these measures

-multinational companies face issues as well

### **Transfer pricing**

-price charged from unit to unit for goods within the company

-most common in vertically integrated environments; several different value creating operations for a product

-profit and investment centres will use this for getting services from service departments and revenues from selling to other departments

-must be goal congruence, top management makes the decision

**: cost options:** market price, cost of production + opportunity cost, full cost, variable cost, cost + with standard or actual costs (less caring for actual), negotiation, dual-pricing (each department records price differently- no incentive to control costs)

-goals and capacity are 2 measures to be used

-tax rates influence as well

-can be sunk costs involved with internal vs. external buying decisions

### **Performance feedback**

-annual review process

-must be consistency with company goals

-could be on a geographic or product line basis

**\*balanced scorecard**- looking at non-financial measures as well

-financial performance, customer satisfaction, internal business processes, innovation and learning

### **Budget Preparation**

Planning-who, what, when, where, and how

-objectives- developed at organizational level; mission statement

-goals- developed at departmental level

-efficient- using as few inputs as possible

-effective- getting the job done

\***short term plans**-less than one year; production, materials, cash flows, income statements

-tactical- quantitative in nature

\***long term plans**- strategies, objectives, goals; internal and external factors; capacity and capital resources; directional

\***intermediate plans**-6 months to 2 years

\***operational plans**- day to day

-single vs. standing purpose plans; contingency plans

-lowest level of personnel make plans

-identify premises for the future

### **Feed-forward controls**

-internal structure that allows completion of objectives

1) Policies- general statement that guides the thinking and actions of employees

2) Procedures- specific directions about how a task should be accomplished

3) Rules- more detailed and less flexible than procedures

**Plans**- communicate, provide notice and reassurance, and enable input from others

**Value Chain analysis**- identify value chain activities, identify cost drivers, develop competitive advantage

-R&D, design, production, marketing, distribution, customer service

### **Budgeting**

-plan leads to budget

\***master budget**- budgeted financial statements, pro forma financial statements; includes balance sheet, income statement, and cash flows

\***sales budget**- most difficult; each department; 1st

\***production budget**- from the sales budget; when units are produced

\***direct labour budget**- Employee Benefit statement

\***COGS budget**- selling and admin, R&D, other budgets, capital budget

-each expense budget broken down into fixed and variable costs

\***cash budget**- last budget prepared

\***operating budget** - sum of all operating budgets; sales, R&D, admin; creates income statement from this

\***financial budget**- creates the balance sheet and cash flows; cash budget and capital budget

\***capital budget**- capital expenditures

\***fixed, static budget**- prepared for only one level of activity;

\***flexible budget**- prepared for different levels of sales; standard cost system needed

\***flexible budget variance**- difference between actual and the flexible budget

\***standard costs**- predetermined or estimated DM, DL and overhead costs

-ideal, theoretical- attainable only under the best conditions

-practical- challenging, but attainable under normal conditions

-used with flexible systems, mainly practical

-setting standard costs- activity analysis (most accurate), historical data, target costing (cost that yields the required profit margin for the product), strategic decisions, benchmarking

\***authoritative standard setting process**- management sets it

\***participative standard setting process**- involved employees set it

\***DM standards**- quality, quantity, price

\***DL standards**- quantity and price

\***overhead standards**- predetermined rate

Supply Denominator-level concepts

1) theoretical or ideal capacity- no allowances for ideal time

2) practical (or currently attainable capacity)- better estimate

Demand denominator-level concepts

1) master budget capacity utilization-

2) normal capacity utilization- recommended to use method

### **Other types of budgeting**

1) zero-based budgeting- starts from 0 every period; not incremental

2) life-cycle budgeting- follows a product through its entire life

3) activity based budgeting- cost drivers are developed

4) kaizen budgeting- continuous improvement

5) continuous budgeting- rolling budget; every month updated

6) project budgeting- specific project

\***Budget reports**- compare actual to budgeted costs; find unfavourable variances via the -

--**control loop**: process which activities are controlled; establish, measure, analyze and compare, investigate, devise and implement, review and revise

\***Responsibility centres**- assignability

\***MBO, management by objectives**- specific goals, participative decision making, explicit time period, continuous feedback;

-realistic expectations, commitment by management, allocation by rewards

### Cost Management

-Fixed costs- per unit changes

-Variable costs- per unit does not change

-Mixed costs- both

\***product costs**- inventoriable costs; DL, DM, overhead, IL, IM

\***prime costs**- DM and DL

\***conversion costs**- DL and overhead

\***period costs**- non-manufacturing overhead; selling and admin; expensed to income statement

\***COGS**- BFGI + Purchases or COGM – EFGI

\***COGM**- DM + DL + Manufacturing applied = Period Manufacturing Costs + BWIP – EWIP = COGM

\***DM**= BI + Purchases – EI

### Overhead Allocation

-factory or manufacturing overhead

-comprised of IM, IL, and general manufacturing overheads like rent and utilities

**A) Standard (Traditional) allocation method**- activity base used to allocate overhead

-use different allocation bases for different departments for more accuracy

\***predetermined rate**- budgeted dollar amount of manufacturing overhead/ budgeted activity level

-use normal capacity utilization

### Costing Systems

1) Standard- standard rates for application rate and allocation base

2) Normal- standard rate for application rate and actual rate for allocation base

3) Actual- actual rates for both

-costs are debited to factory overhead control first; once they are applied to WIP they become applied

-inventory accounts- WIP, finished goods, raw materials

-financial statement locations for costs- COGS, FGI, WIP

-immaterial over(under) applied- applied to COGS

-material amount- applied proportionately to WIP, FGI, and COGS

**B) Activity Based method**- allocation based on cost drivers

-activities lead to cost objects which lead to cost pools and cost drivers

\***activity**- event or task with a specified purpose; designing products, setting up and operating machines, making orders and distributing products

-**categories**- unit-level, batch level, product sustaining, facility sustaining

\***cost object**- anything for which costs are accumulated for managerial purposes; specific job, product line, a market or certain customers

\***cost pool**- collect costs associated with the various drivers

\***cost driver**- anything that causes costs to be incurred each time the driver occurs; set-ups, moving and handling, packaging, casting

-better for companies with diverse products or complex activities; no work with facility sustaining activities

\***resource driver**- measure of the quantity of resources consumed by an activity

\***activity driver**- measures how much of the activity is used by the cost object

**C) Process Costing**- used for assembly lines and homogeneous goods

-all the costs incurred must be allocated to either finished goods or EWIP

-material and conversion costs

**1) Determine physical flow of goods**

-units in beginning WIP + units transferred = units in ending WIP + units completed

**2) Calculate number of units**

-units completed – WIP beginning= units started and completed

**3) Determine when materials are added to process**

**4) Calculate the equivalent units produced**

-FIFO= completion of BWIP + started and completed + started EWIP = EUP

-WAVM= units completed + started EWIP= EUP

-WAVM can never be lower than FIFO; difference is the BWIP

**5) Calculate costs incurred during period**

-FIFO= costs incurred during period + BWIP costs

-WAVM= just costs incurred during period

-WAVM is better when prices are stable

**6) Calculate cost per EUP**

-divide total costs allocated by EUP for both materials and conversion costs

**7) Allocate the costs to the products**

-multiply EUP by the rate per EUP

**Spoilage**

-defective units not transferred to the next process

-normal spoilage- normal and accounted for

-abnormal spoilage- extra and must be expensed on income statement

-shrinkage, rework, and waste

**D) Job Order Costing**

-all costs associated with a particular job are charged to that client

-job order cost sheets are used

-manufacturing overhead must be allocated amongst jobs

**E) Operation Costing**

-combination of job order and process costing

-where furniture or shirts are made; same thing but with differences

**F) Backflush Costing**

-all costs are accumulated during the period and distributed when goods are finished or sold

-raw and in process inventory, conversion costs account, and finished goods inventory

-used in JIT

**G) Life Cycle Costing**

- treats pre-production and after-sale costs as part of production costs
- value chain method; used R&D and sales costs as well
- upstream, manufacturing, and downstream costs
- whole life costing includes warranties

**H) Service Cost Allocation**

- accounting for the different service departments
- 1) Direct method
  - service departments are allocated straight to the production departments
- 2) Step-down method
  - service departments do allocate to other service departments, but only once
  - the one with the greatest proportion allocates first
- 3) Reciprocal method
  - service departments are allocated back and forth to each other
  - most complicated but theoretically correct method

**I) Joint Products**

- split-off point, joint costs, separable costs
- physical unit method- physical measure use; weight
- Relative sales value at split-off method (Gross market value method)
- Estimated Net Realizable Value Method (NRV)
- = sales price – separable costs = NRV

**J) By Products**

- Inventory the byproduct costs (Byproduct recognized at production)
- revenue from sale is treated as a reduction of costs from the main product*
- Revenue from the byproduct (Byproduct recognized at the time of sale)
- usually not used; treated as revenue*

**K) Variable and Absorption Costing**

- 2 different ways of determining the cost of production and presenting the income statement

**Fixed Factory Overheads**

- variable- also called direct costing; fixed factory overheads are treated as a period cost and expensed in the period they are incurred
- absorption- fixed factory overhead is treated as a product cost and is allocated to the products completed during the period; required by GAAP
- when production is greater than sales, absorption will give greater income, and vice versa

**Income Statement Preparation**

- absorption gives a contribution margin
- variable gives a gross margin





# Regulation

## **I. Business Law Ethics and Professional Responsibilities**

1. Contracts
2. Sales
3. Secured Transactions
4. Negotiable Instruments
5. Documents of Title
6. Agency
7. Bankruptcy
8. Surety and Debt Collections Remedies
9. Property
10. Insurance
11. Securities Acts and Antitrust Regulations
12. Regulation of Employment
13. Accountant's Legal Liability
14. Professional Responsibility

## **II. Government Legislation**

1. Government Regulations
2. Government and the Economy
3. Monetary Policy
4. Money Supply
5. Fiscal Policy
6. Government Funding
7. International Business Law
8. Forms of Business Organization
9. Contract Law
10. Legal Evidence

## **III. Laws/Regulations and Regulatory Environment**

### **I. US**

1. Overview of the Regulatory Environment
2. Laws and Regulations

### **II. Canada/SA/UK/ Australia**

1. Overview of the Regulatory Environment
2. Laws and Regulations

# I. Business Law Ethics and Professional Responsibilities

## Contracts

### 1. Elements of a Contract

-a contract is an agreement, a meeting of the minds

#### *6 Elements*

1. offer
2. acceptance
3. consideration
4. proper form
5. lawful object
6. competent parties

### 2. Offers and Acceptances

#### *3 Elements of Offers*

1. seriously intended
2. communicated
3. definite in terms

#### *3 Elements of Acceptances*

1. unconditional
2. communicated
3. only accepted by party to whom it is made

### 3. When Offers End

-counteroffers, rejection, revocation, time stated, death or insanity (does not end contract, just offer), destruction or sale of the subject matter

### 4. When Acceptances are Effective

-mailbox rule applies: if sent quicker if no means of reply specified

-most mistakes have no effect on contracts; unless material facts or wrong or of the party is misled

**\*parole evidence rule-** evidence that contradicts a contract is inadmissible in court

-evidence is admissible if: fraud, after, mistakes, explain

### 5. Contracts that Cannot be Assigned or Delegated

1. personal services contracts

2. increase risk or duty
3. prohibited by the contract
4. insurance contracts

**6. Discharge**

1. performance or prevention of contract
2. by breach
3. by agreement
4. by operation of law
5. conditions

**7. Contract Remedies**

1. compensatory monetary damages
2. liquidated damages
3. specific performance
4. rescission
5. reformation

## Sales

### 1. Formation of Sales Contracts

- governed by Article 2 of UCC
- may still be valid if terms are omitted: delivery, price, place
- offer may be accepted in any reasonable manner
- firm offers are irrevocable without consideration
- modifications may be made without added consideration
- auctions are ok

### 2. Performance of the Parties

- seller and buyer have explicit duties
- buyers may reject nonconforming goods
- seller can cure the nonconforming good
- all parties must act in good faith
- anticipatory repudiation occurs when the buyer or seller states they won't conform
- adequate assurance of performance is expected

### 3. Sales Statute of Frauds

- sales of \$500 or more require written remark which specifies quantity
- some exceptions exist when price is \$500 or more

### 4. Warranties

**\*implied warranties-** created automatically unless they are properly disclaimed: merchantability, warranties of title (good title, encumbrances, infringements), fitness for a particular program

- implied warranties may be disclaimed but the disclaimer must be conspicuous; disclaimer is only effective for warranty actions
- merchantability may be disclaimed orally or as is; fitness may be disclaimed in writing; title may be disclaimed with specific language

**\*express warranties-** must be part of the basis of the bargain; seller is liable for any breach of express warranty

### 5. Rules for Risk of Loss and Title

- risk of loss and title cannot pass until existing goods have been identified on the contract
- once goods have been identified, most important factor in determining risk of loss is agreement between the parties
- shipment and destination contracts
- with documents of title, risk of loss and title pass when the buyer gets the documents
- with nonconforming goods, risk is on seller but transfers to buyer when seller completes delivery requirements
- insurable interest is the buyer's when he gets the goods; is the seller's if they have any part of the title or good in their domain
- CIF means cost, insurance, freight

### 6. Power to Transfer Title

- buyer gets no better title than seller had to give
- entrusting occurs when goods are in a 3<sup>rd</sup> party and they sell them by accident

-one who gets title by fraud may pass it to an innocent buyer

### **7. Remedies**

-buyer may sue to recover damages; but no punitive damages

-buyer may rescind and sue for money damages

-buyer may cover (purchase elsewhere) and sue for losses

-buyer can recover goods from seller, but only if they are identifiable

-seller sue to recover damages if breach

-seller may resell goods if breach

-seller may rescind and sue for damages if breach

-seller may stop delivery if breach

-seller may sue in credit sales as well

-statute of limitations is 4 years

-liquidated damages occur when they agree in advance what damages are for a breach

### **8. Strict Liability in Tort**

-strict privity (old law)- parties in contract are in privity of contract

-UCC Sales users and anyone reasonably affected may sue

-negligence may sue, 4 things: duty of care, breach, damages, causality

-strict liability in tort is liability without regard to fault for defective products: defective products, cause, unreasonably dangerous, business, changes

## Secured Transactions

### 1. 4 Definitions

\***secured transaction**- collateral

\***purchase money security interest creditor PMSI**- creditor who advances money or credit to enable a debtor to get collateral and retains an interest in the collateral

\***after acquired property clause**- creditor takes as collateral property that is to be acquired by the debtor at a later date

\***security interests in proceeds**- a creditor automatically has a security interest in any proceeds from the sale of the collateral

### 2. Attachment

\***attachment**- a creditor's security interest that is valid against the debtor; without attachment a security interest is ineffective against the debtor

#### *3 requirements for attachment*

1. agreement between creditor and debtor, providing for a security interest; oral or written
2. some type of value given by creditor; doesn't have to be PV
3. debtor must have rights in the collateral

### 3. Perfection

\***perfect**- method by which a creditor insures the security interest is valid against most subsequent 3<sup>rd</sup> parties

#### *3 Types*

1. perfection by possession- creditor takes collateral with debtor's permission
2. by filing a financing statement- gives notice to 3<sup>rd</sup> parties of the security interest
3. by attachment- automatic but limited; priority over creditors but not sold to parties

### 4. Secured Creditor v. Purchaser from Debtor

- a perfected creditor usually has priority over a purchaser of collateral from debtor  
 -2 exceptions: when perfected by attachment or when sold by genuine merchant in normal course of business

### 5. Priorities with Multiple Creditors

-perfected creditor has priority over unperfected creditor  
 -if both are perfected, first to file or perfect has priority  
 -PMSI creditors will have priority over earlier perfected on several occasions  
 -if neither is perfected, first to attach has priority  
 -mechanic or artisan lien's before priority security interests if they hold the property; property may be sold to satisfy debts

### 6. 3 Remedies of Creditor After Default

-creditor may repossess collateral after default and sell or lease it  
 -in strict foreclosure, the creditor keeps the collateral but must cancel the entire debt  
 -sue debtor for debt and reduce the claim to a judgment

## Negotiable Instruments

### 1. Types of Negotiable Instruments

1. promissory note, note- promise to pay
2. CD- bank promissory note;
3. draft- written instrument; sight or time drafts
4. check- draft; must be drawn on a bank and payable on demand
- \***cashier's check**- bank is drawer and drawee
5. trade acceptance- draft; order to a 3<sup>rd</sup> party to pay
6. investment securities, documents of title- stocks and warehouse receipts and bills of lading; not commercial paper but follow same rules

### 2. 5 Elements of Negotiability

1. in writing signed by the maker or drawer
2. an unconditional promise or order
3. payable in a certain sum of money
4. payable to bearer of order
5. payable on demand or at a definite time

### 3. Negotiation

- \***negotiation**- transferring commercial paper to a 3<sup>rd</sup> party, a holder; transfer of nonnegotiable instruments is an assignment and is governed by contract laws
- negotiation of bearer paper requires mere transfer of possession
- negotiation of order requires both delivery and endorsement by the proper parties
- all endorsements are either: blank endorsement (payee signs without naming new payee); special endorsement (payee signs and names a new payee)
- \***restrictive endorsement**- the payee adds a restriction or condition, but does not prevent further negotiation or transfer of the instrument
- \***qualified endorsement**- payee adds the words without recourse either before or after their name for the purpose of limiting their legal liability

### 4. Contract Liability

- contract liability is guarantee of payment of the instrument
- \***primary liable**- parties first expected to pay in the instrument
- \***secondary liable**- parties liable if primary liable party fails to pay when the instrument is presented
- time periods in which uncertified checks should be presented: within 30 days for drawers liable and within 7 days for endorsers liable

### 5. Warranty Liability

- warranty liability for any transferor of commercial paper
- any party who transfers commercial paper for consideration makes 5 warranties: good, no fraud, not altered, not insolvent, no 3<sup>rd</sup> claims
- if transfer is made by endorsement, these 5 warranties are made to the immediate transferee and to all subsequent transferees
- if made without endorsement, warranties are only made to the immediate transferee; the 1 transferring has warranty liability but not contract liability

## 6. Accommodation Parties

-an accommodation party is a surety that lends their name to commercial paper to facilitate it being cashed

-accommodations endorsers are secondarily liable

-an accommodation party signing on behalf of a maker is primarily liable

## 7. Holders in Due Course

-a holder is one who possesses a negotiable instrument with all necessary endorsements

-holder in due course HDIC is anyone satisfying 4 requirements: without notice of issues, good faith, PV, not FV, holds the instrument

-HDIC takes the instrument free of personal defences in nonconsumer transactions and only loses to real defences

\***real defences**- satisfies 4 requirements: infancy, material altercations, bankruptcy, illegality or adjudicated insanity, fraud, forgery

-all other defences are personal and are beaten by HDIC

\***shelter provision, holder under holder in due course HUHIDC** – anyone who takes from an HDIC gets all the rights of an HDIC, even if they are not an HDIC

## 8. Forgery Rules

-the forger is always liable

-with forgery of the drawer's name, if the forger is missing, the drawee is liable upon acceptance and payment of the instrument

-with forgery of the payee's name, usually good title does not pass: 2 exceptions

\***imposter case**- if drawer issues check to an imposter, the forgery by the imposter of the real payee's name will pass good title to all subsequent parties

\***fictitious payee case**- usually induces a dishonest agent or employee; maker or agent is liable and can only collect from the agent

## 9. Discharge from Liability

-payment in full by a party to the holder of the instrument discharges that party

-intentional cancellation or destruction of the instrument by the holder discharges all parties

-a written renunciation delivered by a holder to a party, discharges that party

-a material alteration fraudulently made discharges all parties adversely affected

-a holder who unjustifiably releases collateral discharges any party to the extent they are adversely affected by the release

-certification of a check by a bank discharges all prior parties

-an unexcused delay in presentment discharges all prior endorsers



## Documents of Title

### **1. Documents of Title**

-written documents covering goods being transported or stored: 2 types

#### **1. warehouse receipts**

-documents issued by a warehouse acknowledging receipt and storage of the goods specified in the document

#### **2. bills of lading**

-documents issued by carriers for receipt of goods to be transported

-a document of title is negotiable if by its terms goods are to be delivered to bearer or the order of a named party

-as with commercial paper, negotiation of a document of title depends on whether the document is bearer document or order

-typical delivery requirements

-obtaining a negotiable document of title by due negotiation is very similar to the concept of obtaining commercial paper by a holder in due course

-the transferor of a negotiable document of title for value makes 3 warranties to the immediate purchaser: document is genuine, transfer is effective and rightful, transferor has no knowledge of any facts that would impair the validity or worth of the document

-when goods are covered by a document of title, title and risk of loss only pass when the buyer gets the document

-typical rights and liabilities

## Agency

### 1. Agency Formation

- an agent is anyone authorized to act on the behalf of another
- an agency requires an agreement (meeting of the minds) but not consideration
- an agency does not require a writing in most cases: except: land and power of attorney

### 2. Duties of an Agent to a Principal

- an agent owes a principal the duty of obedience, duty of diligence and due care, duty to inform, duty to account, fiduciary duty of utmost loyalty and good faith

### 3. Duties of a Principal to an Agent

- principal has the duty to compensate, duty to reimburse, and the duty to indemnify the agent for any losses

### 4. Termination of Agency

- most agencies are terminable at will
- some events require agency termination by operation of law: death or insanity, bankruptcy of the principal, loss or destruction of subject matter, loss of a license, breach of duty, illegality
- agency coupled with an interest- the agent has a vested interest in the property which is the subject matter of the agency
- notice required upon termination of the agency relationship

### 5. Two Types of Authority

\***actual real authority**- the principal conveys to the agent the right and power to act on the principle's behalf with 3<sup>rd</sup> parties; may express or implied

\***apparent authority, agency by estopped**- the principal gives the appearance to 3<sup>rd</sup> parties that an agent is authorized

### 6. Contract Liability to 3<sup>rd</sup> Parties

- principal is liable for all contracts made by an agent if: agent had either authority, principal ratifies agent's actions
- ratification of an unauthorized contract binds the principal and 3<sup>rd</sup> party
- an agent is liable for all unauthorized contracts
- an agent is not usually liable for authorized contracts unless acting for an undisclosed or partially disclosed principal

### 7. Undisclosed Principal

\*undisclosed principal- the agent makes contract in his own name while really acting for a secret principal; agent has actual but not apparent authority; either may be held liable

\*partially disclosed principal- agent reveals he is making a contract for the principal, but does not reveal the principal's identity; principal or agent can be held liable by 3<sup>rd</sup> party

### 8. Tort Liability to 3<sup>rd</sup> Parties

- a principle is liable for his own tortuous conduct
- \***doctrine of respondent superior**- a principal is liable for all torts committed by an agent, if the agent was acting within the scope of the agency
- agents and independent contractors are personally liable to 3<sup>rd</sup> parties for their torts, whether authorized or unauthorized

-employees injured in scope of their employment may collect worker's compensation benefits, even if they were negligent

# Bankruptcy

## 1. Bankruptcy Overview

-order for relief is instituted on the filing date

-means test is required for all consumer debtors: income statement and monthly living expenses

## 2. 4 Types of Bankruptcy

1. Chapter 7 Voluntary- debtor voluntarily files for liquidation and a trustee is appointed

2. Chapter 7 Involuntary- creditors file to force a liquidation and a trustee is appointed

3. Chapter 11 Reorganization- restructures the debtor's debts so they can continue to operate the business; no liquidation occurs

4. Chapter 13 Adjustment of Debts of Individuals- allows individuals and sole proprietorships to file a repayment plan to adjust their debts; not available for corporations or partnerships

-some may not file for Chapter 7 bankruptcy: railroads (may file under Chapter 11); insurance companies (may not file under Chapter 11); municipalities (may not file under Chapter 11); banks and credit unions and savings and loans(may not file under Chapter 11)

## 3. Property Included in Debtor's Estate

-property of the debtor as of the filing date goes to the trustee to pay creditors; includes proceeds and profits from that property even if gained after the filing date

-property gained by the debtor after the filing is not included in the debtor's estate; the debtor keeps this property

-with leases, the trustee may take this lease or assign the lease

-the trustee can also add property to the debtor's estate by disaffirming preferential transfers, fraudulent conveyances or statutory liens

## 4. 3 Avoiding Powers of Trustee

-the trustee has the power to avoid preferential transfers if 5 tests are met, TANIM: transfer of property, antecedent debt, ninety days, insolvent, more than received

-the trustee must avoid a fraudulent conveyance: a phony property transfer for the purpose of hiding property

-the trustee has the power to avoid certain statutory liens that were unperfected as of the date of the bankruptcy or took effect as of the date of the bankruptcy

## 5. 10 Categories of Debts

-debts are paid in the order of their priority: DAM-WEG-CTFI

1. DAM- domestic support obligations, administrative costs, middlemen debts

2. WEG- wages, salaries, or commission unpaid; employee benefit plan contributions, grain producers and fisherman

3. consumer deposits, taxes unpaid, federal depository institution, death or personal injury claims

## 6. Discharge

-upon completion of bankruptcy under Chapter 7, the debtor receives a discharge from most of their debts; corporations and partnerships are denied a discharge in bankruptcy

- certain actions by the debtor will preclude a discharge: too many times, not following rules, bad records, hid assets, false claims
- even if a discharge is granted, certain debts are excepted from discharge: unscheduled debts, student loans, DUI damages, 1,150 or more within 60 days of filing, taxes within 3 years, fraud debts, injury debts
- a court may revoke a bankruptcy discharge upon request of the trustee or creditor within 1 year for any of the following: fraud, false claim, court issues

## Surety and Debt Collection Remedies

### 1. Surety Relationship

\***surety**- one who promises to pay the creditor if the debtor defaults

\*statute of frauds- a signed writing is required for a surety's promise to be enforceable

-if they are all 3 created at the same time, the surety owes no additional consideration; if the surety comes in after the debtor/creditor relationship, the surety must provide additional consideration

### 2. Rights of a Surety

1. subrogation- surety gets rights of creditor once they pay off the creditor

2. reimbursement- the right of the surety to recover from the debtor any money the surety had to pay the creditor due to the debtor's default

3. exoneration- the right of a surety to get a court order that debtor pay prior to default

### 3. Cosureties

-2 or more sureties of the same debt; even if unaware of each other

-cosuretors are joint and severally liable if the debtor defaults; creditor can sue any of the cosuretors or all of the cosuretors

\***right of contribution**- once the cosuretor pays, they receive a pro rate share or contribution from all other cosuretors

### 4. Rights of Creditor After Default

-creditor may: demand payment from surety or debtor; and request collateral

\***guarantor of collection, conditional guarantor**- exception; promises to pay only after creditor has exhausted all remedies; must give prior notice of this to creditor

### 5. Defences of Surety v. Creditor

-lack of writing or lack of consideration are good defences for a surety

-payment or tender of performance by debtor is always a good defence for a surety

-fraud by the creditor is a good defence for the surety

-surety may usually use any defence to the contract available to debtor, except defences that are personal to the debtor: infancy or insanity

-any action by the creditor

### 6. Creditor Debt Collection Remedies

-may sue the debtor and obtain a judgment

\***pre-judgment remedies**- writ of attachment (lien) and pre-judgment garnishment

\***post-judgment remedies**- writ of execution and garnishment

-for fraudulent conveyance, or hiding of property, creditor may still attach the property

### 7. Debtor Debt Collection Remedies

\***composition of creditors**- agreements between debtor and creditors to settle for less

\***assignment for benefit of creditors**- voluntary property transfer to a 3<sup>rd</sup> party trustee for settlement

\***equity receiverships**- a court appoints a receiver (disinterested 3<sup>rd</sup> party) to collect the debtor's assets and income and distribute them as the court directs

\***Fair Debt Collection Practices Act**- makes illegal abusive, deceptive, and unfair debt collection by collection agencies (covers collection agencies, not the original creditor)

-more laws: truth in lending, equal credit opportunity act, fair credit billing act, credit card fraud act

-certain property is exempt: homestead exemption protects primary residence from attachment by creditors; IRS liens still apply to homestead; social security benefits are exempt from attachment or garnishment

-mortgagees do not qualify for homestead

# Property

## 1. Types of Property

\***real property**- includes land and interests firmly attached to the land; intangible interest (mortgages)

\***personal property**- chattels, be tangible (furniture) or intangible (stocks, trademarks)

\***fixtures**- personal property that have become so attached to real estate that it becomes real estate as a matter of law; must be intended and adapted to

-trade fixtures (items used in trade or business) are usually personal property

## 2. Ways to Acquire Personal Property

-by: sale, gift (donative, intent, delivery, acceptance), inheritance, or finding property

## 3. Real property Deeds

### 4 Elements of Deeds

1. in writing
2. signed by the grantor
3. description of the property
4. be delivered

### 3 Types of deeds

1. general warranty deed- owner guarantees the title as follows: right to convey, no unstated encumbrances, quiet enjoyment (no liens)
  2. special warranty deed- only guarantees that title has not been impaired by some action of the grantor during the period of his ownership
  3. quitclaim deed- does not guarantee any title, but rather transfers whatever right, title, or interest the grantor may have in the property
- a contract for sale of land impliedly promises the seller's title will be marketable

## 4. Title Insurance

- protects the owner against losses due to defects of record in their title
- the policy usually excludes certain defects from coverage
- the policy cannot be assigned to a 3<sup>rd</sup> party

## 5. Recording of Deeds and Mortgages

-recording gives constructive notice to all subsequent 3<sup>rd</sup> parties of your interest; notice is not required for the immediate parties to the transaction

-if a mortgage or deed is not recorded, a subsequent party may gain a superior interest in the property; 3 different recording statutes: notice jurisdiction (lose to 3<sup>rd</sup> parties without notice whether or not they recorded), race jurisdiction (first party to record wins), notice-race or race-notice jurisdiction (lose to 3<sup>rd</sup> parties without notice only if you didn't record)

## 6. Co-ownership of Property

\***tenancy in common**- form of co-ownership where interest can be: undivided, inherited, and transferred

\***joint tenancy**- form of co-ownership with: undivided interest, equal interest, rights of survivorship

\***tenancy by the entities**- joint tenancy between husband and wife



-if the type of co-ownership is unclear, the law counts it as a tenancy in common

### **7. Mortgages**

-most states follow the lien theory of mortgages

-4 elements of mortgages: writing, signed by the mortgagor, description of property, delivered

-if there is a foreclosure and sale of property, the sales price is allocated

-rights of redemption differ for prior to judicial sales and after judicial sales

-mortgages can be assumed, novation, or buying without subject to mortgage

-mortgages are regulated by the Real Estate Settlement Procedures Act RESPA

### **8. Leases**

-types of leasehold states: tenancy for years, periodic tenancy, tenancy at will, tenancy at sufferance

-to be enforceable, a real estate lease must give the tenant an exclusive right of possession

-neither death nor sale of property ends a lease

-leases may be assigned or subletted

-in most states, a lease contains an implied warranty of habitability, that leased premises are fit for ordinary uses

-the Fair Housing Act prohibits discriminating in leases or sale of property on the basis of race, colour, sex, religion, or national origin or family status

### **9. Bailments**

-the temporary transfer of possession, but not title, to personal property by a rightful owners

-bailee has 2 duties: care for and return the property

-the bailee must exercise due care for bailed property in their possession

-the bailee has absolute duty to return the property when: was required to or is liable to

-common carriers and innkeepers are extraordinary bailees; they are strictly liable for loss or damage to the goods regardless of fault

-bailee carriers may limit their liability by contract

## Insurance

### 1. Insurable Interest

-to obtain property insurance, you must have an insurable interest in the property being insured

-an unsecured creditor has no insurable interest in debtor's property

-many people can have insurable interests

### 2. Standard Policy Provisions

-negligence by the insured does not usually prevent recovery

-warranties in property insurance are strictly construed; a material breach of a warranty relieves the insurance company of the duty to pay for a loss

\***co-insurance**- a % which limits recovery if there is insufficient insurance and there is partial property damage

\***pro-rate clause**- involves 2 insurance companies with same interest; pay fair share each

\***subrogation**- once the insurance company pays the insured they get all of the insured's rights

-insured will never be paid more than the lowest amount of: insurable interest at time of loss, face value of policy, FMV pf property at time of loss

-the standard fire insurance policy protects the insured against losses due to fires

## Securities Acts and Antitrust Regulation

### 1. Federal Securities Regulation

-2 main federal securities laws: SEC Acts 1933 1934

-securities include almost any type of multi-state investment contract; do not include general partnership interests or CDs

-states also have securities laws: blue sky laws

### 2. Liability Under Federal Securities Acts

-criminal liability: both acts have criminal sanctions providing for fines, imprisonment, or both

-civil liability: section 11 of 1933 act permits suits for monetary damages against the issuer, directors, or partners of the issuer, those signing the registration statement and experts; section 10b (anti-fraud) of 1934 and section 18 (liability for false or misleading statements) permits suit for monetary damages against anyone involved with the stock even if the securities are exempt from registration

### 3. 2 Main Requirements of SEC Act 1933

-basic purpose of 1933 act is to provide investors with information

2 main requirements: file a registration statement, give a prospectus

-if these are not met there is liability and investors can get their money back for the stock

### 4. Registration Exemptions Under SEC Act 1933

- I DANCE

-intrastate offerings, regulation D, regulation A, no sale transactions, casual sale, exempted securities (railroads, banks, governments, insurance policies, commercial paper)

### 5. Registration Required Under SEC Act 1934

-national stock exchanges, brokers, dealers, and national securities associations must register with the SEC and their activities are regulated

-reporting companies must register with SEC: registered companies or assets >10 million

### 6. Required Reports Under SEC Act 1934

-3 periodic reports required: annual (10-K), quarterly reports (10-Q), current reports (8-K)

-periodic reports must be filed by all reporting companies

### 7. Antitrust Legislation

1. SOX Act

2. Interstate Commerce Act 1887 and Sherman Antitrust Act 1890- price fixing, pools of competitors

3. Clayton Antitrust Act 1914- merger issues and price discrimination

4. Robinson-Patman Act 1936- price discrimination

5. Celler-Kefauver Antimerger Act 1950- amended Clayton

6. Hart-Scott-Rodino Act 1976; Antitrust Improvement Act 1976- federal agencies review mergers

## Regulation of Employment

### 1. Worker's Compensation

- state worker's compensation laws require that employees receive benefits if they are injured in the scope of their employment
- the employer will provide coverage to all eligible employees
- the employer is strictly liable without regard to fault
- the employer provides for insurance to pay for benefits
- worker's compensation benefits are the employer's exclusive remedy against the employer
- worker's compensation does not preclude suit against 3<sup>rd</sup> parties causing the injury

### 2. Federal Unemployment Tax Act

- provides unemployment benefits to those unemployed through no fault of their own
- state systems are funded by taxes paid by employers; not paid by the employee

### 3. Federal Insurance Contribution Act

- social security FICA provides for: OASI, DI, HI, SSI
- FICA tax is imposed on employers, employees and the self-employed
- the employee's tax is a % of their wages
- the employer must match the employee's payment
- the tax rate for the self-employed is 12.4% of the first 90,000 in net earnings for OASDI (Old Age and Survivors Disability Insurance) and 2.9% of net earnings for Medicare for 2005
- benefits vary greatly depending on the program

### 4. Employee Retirement Income Security Act

- ERISA regulates existing pension plans; doesn't require formation of or define benefits
- requires that information be furnished to employees and beneficiaries
- establishes standards for pension plan funding, investment of pension funds and other financial controls to avoid mismanagement
- funding for pensions may be either contributory or noncontributory
- guarantees payment of certain benefits if a defined benefit plan is terminated. Through a federally chartered corporation
- has both civil remedies and criminal penalties for violations

### 5. Occupational Safety and Health Act

- OSHA's purpose is to provide a safe and healthy work environment
- OSHA has the power to establish standards and promulgate rules and regulations governing workplace safety
- penalties: OSHA can issue citations, impose fines, and civil penalties or obtain injunctions
- OSHA permits state regulation of workplace safety and health under federal supervision

### 6. Employment Discrimination

- Title VII of Civil Rights Act prohibits discrimination based on race, colour, religion, sex or national origin in employment, but does not cover age discrimination

- Age Discrimination in Employment Act ADEA is EEOC administered and prohibits discrimination based on age of individuals 40 or older
- Equal Pay Act is EEOC administered and prohibits sex discrimination regarding pay
- Rehabilitation Act 1973 and American with Disabilities Act ADA prevent discrimination of the disabled
- defences: bona fide occupational qualification BFOQ; professionally developed ability test; seniority or merit system; national security issues

### **7. Federal Fair Labour Standards Act**

- FLSA prohibits oppressive child labour and provides wage and benefits standards
- requires overtime pay of 1.5 times for over 40 hours
- exemptions exist for salaried workers and other certain occupations
- FLSA is administered by the Department of Labour

### **8. Family and Medical Leave Act**

- FMLA entitles employees to take 12 weeks of unpaid, job-protected leave in 1 year
- job protection provisions include: insurance and job maintenance
- FMLA permits private law suits for violations and the Department of Labour may bring action in court to compel compliance

### **9. Consolidated Budget Reconciliation Act**

- COBRA-if employee voluntarily quits or is terminated, health insurance coverage can be retained by employee for 18 months at employee's expense
- an employer does not have to provide coverage if the employee becomes covered under a spouse's insurance plan or under a different plan with a new employer

### **10. Worker Adjustment and Retraining Notification Act**

- WARN requires that employers give 60 days advance notice of mass layoffs or plant closings
- the Act applies to employers with 100 or more employees

### **11. Union and Employee Relations**

- governed by National Labour Relations Act of Wagner Act
- 1. Taft-Hartley Act
  - eliminated closed shops but not union shops
- 2. Right-to-Work Laws
  - don't have to join a union; not all states have them

## Accountant's Legal Responsibility

### 1. Liability to Clients

-accountants are liable for any breach of their personal contracts with clients; stated in engagement letter

-liable for negligence or fraud

#### **4 Elements of Negligence**

1. duty of care

2. breach

3. damages

4. causality

#### **5 Elements of Fraud**

1. material misrepresentation

2. scienter (actual fraud)/ reckless disregard for truth (constructive fraud difference)

3. reasonable reliance

4. intent to rely

5. damages

-an accountant may not disclose confidential client information without the consent of the client

-working papers of an accountant are also confidential and may not be disclosed without the consent of the client

### 2. Liability to 3<sup>rd</sup> Parties at Common Law

-an accountant's liability to a client for negligence is based on the failure of the accountant to perform contractual duties with due care

-thus, many courts restrict the right of 3<sup>rd</sup> parties to sue accountants for negligence because they are not in privity of contract with the accountant (privity defence, Ultramares)

-most states have expanded Ultramares to make accountant's liable for negligence to foreseen users and any foreseen class of users

-limitations on use of the privity defence: privity is only a defence to negligence actions and to negligence actions by 3<sup>rd</sup> parties

### 3. Liability Under the SEC Act 1933

-33 requires a registration statement filed with the SEC containing audited financial statements prepared by public accountants for public sales of securities

-civil liability for accountants under Section 11 of 1933; accountants are liable for material misrepresentations or omissions of fact in the registration statement

-accountants are criminally liable for willful violations under Section 24 and may be fined up to 10,000 and/or imprisoned for up to 5 years

### 4. Liability Under the SEC Act 1934

-34 covers stock sold on national stock exchanges in interstate commerce and requires reports and financial statements prepared by public accountants

-civil liability under Section 10b (anti-fraud) accountants are liable for material misrepresentations or omissions of fact in the purchase or sale of any security; Civil

Liability Section 18 accountants are liable for false or misleading statements of material facts in reports filed with the SEC

-accountants are criminally liable for willful violations of Section 10b and Section 18 may be fined and/or imprisoned

**5. Private Securities Litigation Reform Act 1995**

-auditors who audit financial statements under SEC Act 1934 must establish procedures to detect and identify fraud, illegal party transactions, and doubt

-upon discovering fraud or illegality, the auditor must report to management and audit committee and then to the board

-the board must report to the SEC within 1 business day

-accountants are civilly liable for failure to comply with this act, but may not be privately sued for reporting to the SEC

## Professional Accountability

### 1. Code of Professional Conduct

-code is derived from bylaws of AICPA

#### 4 Parts

#### 1. Principles of Conduct

-6 principles: responsibilities, the public interest, integrity, objectivity and independence, due care, scope and nature of services

#### 2. Rules of Conduct

-11 rules: independence, integrity and objectivity, general standards, compliance with standards, accounting principles, confidential client information, contingent fees, acts discreditable, advertising and other forms of solicitation, commissions and referral fees, form of organization and name

#### 3. Interpretations of Rules of Conduct

-adopted by the professional ethics division to provide guidelines as to the scope and application of the rules

#### 4. Ethics Rulings

-formal rulings by the professional ethics division that apply the rules to specific factual circumstances

### 2. Responsibilities of CPAs in Business and Industry

-6 rules of conduct apply to CPAs in public sector and business: integrity and objectivity, general standards, compliance with standards, accounting principles, acts discreditable, commissions and referral fees

5 rules of conduct CPAs private practice: independence, confidential client information, contingent fees, advertising and other forms of solicitations, form of organization and name

### 3. Proficiency, Independence, and Due Care

3 general audit standards: proficiency, independence, due care

### 4. Statements on Standards for Consulting Services

-statements on standards for consulting services SSCS apply to CPAs performing consulting services

#### 6 types of consulting services

1. consultations

2. product services

3. advisory services

4. staff and other support services

5. implementation services

6. transaction services

-the general standards apply to consulting services as well; objective advisor is primary role of auditor

### 5. Statements on Responsibilities in Personal Financial Planning Practice

-guidelines only, not rules



-basic engagement functions, working with other advisors, implementation of standards, monitoring and updating engagements

#### **6. Disciplinary Systems Within the Profession**

-resignation of membership, termination for nonpayment of financial obligation or compliance with membership-retention requirements, disciplinary suspension and termination of membership without hearing, disciplining of member by trial board, reinstatement, publication of disciplinary action

-state boards must conduct investigations before issuing decisions; could be criminal convictions, misconduct

## II. Government Action

-regulation on business, taxation schemes, contracts, legal evidence, key economic indicators, international trade

### CMA-Regulation/Ratios

#### Accounting Standards

-direct users- people who use the info

-indirect users- people who back up the people who use the info

#### GAAP

-Auditing Standards Board AU 411- GAAP encompass the conventions, rules, and procedures, necessary to define accepted accounting practice at a given time

\***Securities Act of 1933**- security issuance; registration and prospectus

\***Securities Act of 1934**- periodic reporting, after issuance

-SEC turned authority over to AICPA, which created CAP and issued ARB

-then APB created Opinions, then the Wheat Committee created the FASB

-SFAS and Interpretations have the highest authority

#### GAAP Hierarchy

1) FASB SFAS's, Interpretations, AICPA CAP ARB's, AICPA APB Opinions

2) FASB technical bulletins, -AcSEC publishes Auditing and Accounting Guidelines and SOP

3) AICPA practice bulletins, ETIF statements (consensus short term opinions)

4) AICPA Accounting Interpretations, FASB implementation guides, misc.

5) IASB, SEC papers, other papers, and Concepts

\***Financial Accounting Foundation (FAF)**- oversees FASB, GASB, and FASAC

\***Financial Accounting Standards Advisory Council (FASAC)**- consults and advises with FASB on major issues

\***FASB**- 7 full time salaries members; 4 be CPA's; private sector group

-created ETIF Emerging Issues Task Force to deal with new issues

-standards issued first then the interpretations

-Statements of Financial Accounting Concepts lay the base for GAAP; 6 of them

#### **SFAC 2- Qualitative Characteristics of Accounting Information**

-materiality and cost/benefits are the 2 main premises

\***understand ability**- person with reasonable knowledge and reasonable diligence can understand

\***relevance**- whether or not the information can make a difference in the decision

-predictive value, feedback value, timeliness

- \***reliability**- free from error and bias
- verifiable, representation ally faithful, neutral
- \***comparability**- different periods and different companies
- \*consistency- GAAP is same over periods
- IASB- was the IASC, London

### **External Auditing**

- auditor's job is to provide assessment on the fairness of the statements
- obtain reasonable assurance
- Audit report- what was audited, what the auditor did, and the auditor's opinion
- \***unqualified opinion**- all is well with the financial statement
- \***qualified opinion**- insert an except for opinion before the opinion section
- \***adverse opinion**- worst type, the financial statements are not correct
- disclaim an opinion means they cannot say
- subsequent notes and additions may need to be made to the balance sheet

### **SOX**

- 1) established PCAOB
- 2) cannot offer other help besides the audit
- 3) must rotate lead auditors every 5 years
- 4) the auditor reports to the audit committee
- 5) the big positions cannot have been with the audit company within a year
- 6) public company audit committees
- 7) corporate responsibilities
- 8) directives to SEC
- 9) broader enforcement authority given to SEC
- 10) corporate and criminal fraud accountability

## Government Regulations

-all business are subject to laws

### **3 Types**

#### **1. Environmental Law**

-usually vary from country to country, but can have international protocols; hard to enforce

3 types: clean air legislation, clean water legislation, treatment and disposal of hazardous wastes

-International Protection of the Ozone Layer- US and 23 other countries, 1987

#### **2. Securities Regulation**

-to prevent fraudulent practices relating to the issuance and trading of securities

-SEC, 1933 and 1934

#### **3. Antitrust Regulation**

-makes competition more fair

-illegal practices: price-fixing, division of markets, group (collective) boycotts, resale price maintenance, monopolistic mergers, exclusive dealing, tie-in-sales, price discrimination, interlocking directorate (>1,000,000 in capital)

-consumer protection laws: product liability, privacy rights, unfair business practices, credit card fraud, misrepresentation, other interactions

#### **Criminal Law**

-type committed is a function of the opportunities available

### **4 Types**

#### **1. blue-collar crime**

-more physical in nature; more obvious

#### **2. white-collar crime**

-tax evasion, embezzlement, fraud

#### **3. corporate crime**

-by the firm for the firm

#### **4. organized crime**

-RICO, 1970

-must be guilty 2 times in a 10 year period; 20 years in jail and \$25,000 fine

## 2. Government and the Economy

-2 tools are monetary policy and fiscal policy

## Monetary Policy

- FED established by an act of Congress to be separate from the federal government
- for the economy to be healthy, the money supply should grow as fast as the economy
- goal is to achieve a full-employment, noninflationary level of total output

### Fed Reserve System

- directed by a board of governors; 7 members appointed by the President
- the board is responsible for administering monetary policy and running the banking system; equal to a Central Bank
- chairman and vice-chairman appointed every 4 years; rest serve 14 year staggered terms
- FED is divided into 12 geographical districts
- functions include: control the money supply, check collection, fiscal agent of the US government, supervise banking system, hold reserve deposits for member institutions
- federal funds market has developed for federal funds rate to other member banks; overnight borrowing; fed funds rate is the interest on these loans

### 3 Main Tools

#### 1. open market operations

- most important
- purchase and sale of government securities (bonds and notes) on the open market
- purchases are expansionary and sales are contractionary

#### 2. reserve requirements

- infrequently used, but powerful
- reserve ratio is the % of deposits banks must have; lowering this increases the amount of money available for circulation

#### 3. discount rate

- rate at which member banks may borrow from the Fed
- lowering it increases the money supply
- minor tools: moral suasion, persuasion; margin requirements; selective credit controls

### Aspects of

- inflation must be controlled; prices cannot rise when there is no money available
- now firms can borrow abroad and can borrow on credit
- recognition lag is the time it takes to recognize a downturn in the economy
- monetarists' favour letting the economy work itself out, because attempts to eliminate fluctuations just increase the effects of those, and they aren't felt until later
- tight policy reduces the money supply and increases unemployment

## Money Supply

-must analyze money supply and demand

-money can be: medium of exchange or store of value

**\*velocity of circulation**-  $\bar{v}$  of times a year average dollar changes hands to buy goods and services before it is taken out of circulation

### **Definitions of Money**

M1- narrow money; all money in immediately spendable forms

M2- broad money; includes money markets, savings accounts, small time deposits

M3- widest measure; large time deposits, institution money markets, eurodollars

### **Short-term Demand**

-demand for money is based on how much money people want to hold as cash and not in the bank getting interest

### **2 Determinants**

#### **1. interest rates**

-money supply is fixed in the short run

-when interest rates are high, high opportunity cost to holding money; so people will deposit it into banks to loan out for more assets

-cause movements along the demand curve

#### **2. level of income**

-as income rises, people will want more money to make transactions

-cause shifts of the demand curve

**\*liquidity preference function**- demand curve for money; inverse relationship between interest rates and the demand for money

-interest rate and money demand graph

## Fiscal Policy

- interaction of taxation and government expenditure
- can increase expenditure or decrease taxes to expand the economy
- price and GDP graph

### **Government Budget Surplus (Deficit)**

- excess of government tax collections over government transfers and purchases
- Keynesian economics say fiscal policy should be expansionary when in recession
- thus, deficit spending is the result of expansionary fiscal policy; can lead to inflation
- \***budget deficit**= cyclical deficit + structural deficit
- cyclical deficit is caused by the downturn in the economic cycle; government receives less in tax and pays out more in social security
- structural deficit is the normal deficit at full unemployment; caused by government spending more than it receives in tax
- under the Full Employment Act of 1946, the government assumed responsibility for full employment; can enter markets as it sees fit
- \***transfer payments**- government transfers of money in the form of negative taxes designed to redistribute income; Medicare, foodstamps, welfare, unemployment compensation

### **2 Consumption Goods**

- used to analyze the government's role in the marketplace
- 1. public- services to the public; highways, military
- 2. private- allow only 1 individual to benefit
- \***spillover benefits**- when people receive unintended benefits from a private sector good
- why the market may not allocate goods efficiently

## Government Funding

### *2 Ways Government Raises Money*

#### **1. debt financing by the government**

-more beneficial to consumers because: individuals lend their money and get returns; debt payments spread out over time so future generations share

2 effects of debt financing: crowding out effect (slows economy); crowding in effect (speeds economy)

#### **2. taxes**

-more burdensome on the US economy; primary measure

#### ***Methods of Taxation***

1. benefits received- tolls used, public parks

2. ability to pay- taxes are paid when you have money; cash basis, not accrual; progressive

#### ***Tax Rate Structure***

1. progressive tax- as income increases, so do taxes; need an inflation measure

2. proportional tax- same tax paid by all; Russia

3. regressive tax- higher income, lower % of income paid as tax; sales taxes

\***marginal tax rate**- tax rate charged to the next dollar of income; progressive system, marginal is higher than existing rate

\***average tax rate**- total tax liability / total taxable income

\***effective tax rate**- total tax liability / total economic income ; includes munis interest

\***direct taxes**- imposed on taxpayer and paid directly to government; income taxes and social security

\***indirect taxes**- levied on goods and services; sales tax and employer paid social security

\***incidence of taxation**- person who actually pays for the tax; property taxes result in higher prices to consumers; windfall tax is a onetime on output, to contrast

\***value added tax VAT**- tax on the value that a business adds to the good it sells; difference between sales and purchased inputs of the company

-every company collects on what it sells and pays on what it purchases; remitted to government

-regressive tax; tax of consumption, so people with lower income pay a higher % on it

-revenues and expenses are reported excluding VAT, unless it is unrecoverable and thus can be capitalized and amortized

-ultimately paid by the consumer in the form of higher taxes



## International Business Law

-difficult to enforce, but most countries comply because it facilitates commerce

### *Sources of International Law*

1. customs- accepted methods
  2. treaties- formal agreements
  3. conventions- treaties among multiple countries
  4. judicial precedents
  5. international political organizations- ICJ, UN
  6. international trade committees and agreements- WTO, NAFTA, EU
- to avoid double taxation, countries adopt tax treaties or use offshore shelters

## Forms of Business Organization

### *3 Main Forms*

#### **1. Corporation**

-legal separation from owners, limited liability, easy transfer of ownership, easy to raise capital

-double taxation, and loss of ownership

#### **2. Partnership**

-each person responsible for debts; easier to form

-multiple types

-limited liability partners can exist

-do not pay taxes, partners do

-joint ventures are usually created for 1 transaction

-LLC is a hybrid between partnership and corporation; members, not partners

#### **3. Sole Proprietorship**

-easiest to form

-1 person, all control, all liability

## Contract Law

- law that is founded in judge-made (common law)
- governs realty and personal service
- transactions involving sale of goods governed by Article 2 of UCC; UCC overrides common law
- will be 1 and 2; can not be 3

### *Types of Contracts*

#### 1. bilateral v. unilateral

\***bilateral**- promise for a promise; each person gives a promise

\***unilateral**- promise for an act; person performing act must be aware of the promise

#### 2. executed v. executory

\***executed**- been fully performed

\***executory**- not been fully performed

#### 3. void v. voidable

\***void**- not enforceable against either party; illegal reasons or no agreement

\***voidable**- one party can cancel without penalty

### *Elements of Valid Contracts*

#### 1. Offer

-to be valid must be: 1) seriously intended (reasonable person test) 2) communicated (words or actions) 3) definite in terms (time, quantity, and price stated)

-advertisements and price quotes are not offers; invitations to bid

### *Revocation of an Offer*

1. effective when received by the offeree, not sent by offeror

2. offeror can revoke any time before acceptance

3. offeror can guarantee being open, but can still revoke

### *Exceptions*

1. when consideration is paid, must keep open; option contract

2. firm offers governed by UCC are irrevocable

3. offer ends when stated by offeror; no time stated, reasonable person test

#### 2. Acceptance

##### *2 Requirements*

##### 1. unconditional

-offeree must comply with all offeror's terms and conditions

-requests and inquiries do not end an offer; counteroffer ends an offer; rejection ends an offer; revocation ends an offer; death or insanity ends an offer; destruction of the subject matter ends an offer; sale of subject matter ends an offer

##### 2. communicated

-can be through words or actions

### *Effective Acceptances*

-acceptance is not assignable

1. mailbox rule- when mailed is effective

2. faster means of acceptance- if not stated ok

3. slower means of acceptance- effective only when received

### **3. Consideration**

-what is given up in the contract

#### ***Issues***

1. legally sufficient
  2. not limited to money
  3. past consideration is not legally sufficient
  4. pre-existing obligations are insufficient consideration
- when a contract term is changed, must be new consideration provided

### **4. Proper Form**

- generally no excepted form or format; not have to be in writing
- under the Statute of Frauds, some contracts must be in writing; does not have to be signed, but is enforceable against whoever signed it
- terms of the agreement may be contained in more than 1 contract

### ***5 Contracts Statute of Frauds***

1. sale of goods \$500 or more
2. realty contracts
3. long-term contracts; more than 1 year
4. assumption of the debt of another person
5. marriage contracts

### **5. Lawful Object**

- subject matter must be legal
- non competes are legal as long as they are reasonable

### **6. Competent Parties**

-must be mutual assent, meeting of the minds

#### ***3 Incompetent Parties***

1. minors (legal infants)- 18, can disaffirm contracts
2. incapacitation due to drug abuse
3. insanity- must be adjudicated insane

## Legal Evidence

**\*audit evidence-** physical, testimonial, documentary, analytical

**\*legal evidence-** relies heavily on oral testimony

-secondary, primary, direct, circumstantial, conclusive, corroborative, opinion, hearsay

### ***Standards of Legal Evidence***

1. sufficient evidence- professional judgment, materiality, inherent risk
2. competent evidence- good evidence, supports the conclusion
3. relevant evidence- related to the task at hand

# III. Laws/Regulations and Regulatory Environment

## I. US

### 1. Overview of the Regulatory Environment

1. Federal Reserve System
2. Office of the Comptroller of the Currency
3. FDIC
4. State Regulatory Systems
5. National Credit Union Administration NUCA

### 2. Laws and Regulations

- Regulation A- Borrowing by Depository Institutions
- Regulation B- Equal Credit Opportunity Act
- Regulation C- Home Mortgage Disclosure Act
- Regulation D- Reserve Requirements
- Regulation E- Electronic Funds Transfer Act
- Regulation F- Limitations on Interbank Liabilities
- Regulation G- Disclosure and Reporting of CRA-related Agreements
- Regulation H- Membership of State Banking Institutions in the Federal Reserve System
- Regulation I- Issue and Cancellation of Capital Stock of Federal Reserve Banks
- Regulation J- Collection of Checks and Other Items
- Regulation K- Edge Act
- Regulation L- Interlocks Act
- Regulation M- Consumer Leasing
- Regulation N- Relationships with Foreign Banks and Bankers
- Regulation O- Loans to Executive Officers
- Regulation P- Bank Protection Act
- Regulation Q- Interest on Deposits
- Regulation S- Reimbursement for Providing Financial Records
- Regulation T- Credit by Brokers and Dealers
- Regulation U- Credit by Banks for Purchase of Margin Stocks
- Regulation V- Fair Credit Reporting
- Regulation W- Transactions Between Member Banks and Their Affiliates
- Regulation Y- Bank Holding Company Act
- Regulation Z- Truth in Lending
- Regulation AA
- Regulation BB- Community Reinvestment Act
- Regulation CC- Availability of Funds and Collection of Checks

Regulation DD- Truth in Savings

Regulation EE- Netting Eligibility for Financial Institutions

Regulation FF- Obtaining and Using Medical Information in Connection with Credit

### **3. Stock Exchanges and Other Markets**

#### **IV. The Regulatory Environment**

##### **1. Overview of the Regulatory Environment**

1. *Function of Central Bank*
2. *Function of Insurance Regulators*
3. *Function of Securities Regulators*

##### **2. Laws and Regulations**

1. *Equal Credit Opportunity/Antidiscrimination*
2. *Home Mortgage Disclosure*
3. *Reserve Requirements*
4. *Insider Transactions*
5. *Lending Disclosure*
6. *Deposits Disclosure*
7. *Real Estate Sales Disclosures*
8. *Self-assessment of Internal Controls/Risk Management*
9. *Investor/Depositor Protection*
10. *Financial and Personnel Information Privacy*
11. *Anti-money Laundering*

##### **3. Stock Exchanges and Other Markets**

## Overview of the Regulatory Environment

### 1. Federal Reserve System

- banks must purchase stocks of other banks to be members of the FRS; depends on size
- see above section

### 2. Office of the Comptroller of the Currency

- charters, regulates, and supervises all national banks and branches of foreign banks
- DC headquarters with 6 district offices and a London office
- established in 1863 as an office of the Treasury; comptroller is appointed by president for a 5 year term; comptroller is also director of the FDIC and Neighbourhood Reinvestment Corporation
- provides onsite reviews of banks and issues rules; has access to all the bank's records
- the National Bank act re-commissioned the office; the Civil War was why the government issued national currency; today the OCC regulates 2,600 banks having 58% of the US commercial bank assets
- funding comes wholly from assessments on national banks; also receives interest income from US Treasury securities

### Standard for Developing Regulations

- issues risk-focused and results-focused regulations
- also issues differential regulations for specific banks; some are based on CAMEL
- CAMEL: capital adequacy, asset quality, management, earnings, liquidity; not publicly viewable
- CRA ratings: community reinvestment act; outstanding, satisfactory, needs to improve, substantial noncompliance
- sometimes banks must consult the OCC before expanding their business operations
- OCC coordinates with other agencies as well for better regulation formation
- OCC allows 60 days for public feedback
- also has many traditional mechanisms for feedback

### 3. FDIC

- since 1933 ensures stability and confidence in the banking system
- ensures deposits up to 100,000 and helps failing banks
- 5 member board of directors appointed by the president
- administers 2 deposit funds: bank insurance fund BIF and savings association insurance fund SAIF
- the BIF is the main one, and the SAIF was created from the S&L scandal
- gets their funding from member deposit insurance premiums
- must use the least costly approach to resolving failing banks
- only protects deposits, not securities
- FDIC is primary regulator of state non-member banks and is backup administrator for the other member banks
- examinations and preventative methods are the main way they prevent issues
- examinations conducted: CRA, compliance, information systems and E-banking, safety



and soundness, trust, laws and regulations, examiner training program, consumer affairs program and publications, community affairs program

#### **4. State Regulatory Systems**

-all states have different regulations, so they have little importance

#### **5. National Credit Union Administration NUCA**

-independent federal agency that supervises and insures 6,707 federal credit unions and insures 4,134 state-chartered credit unions

-entirely funded by credit unions and receives no tax dollars

-independent financial regulatory agency of the federal government; also insures state credit unions which qualify

### **1. Overview of the Regulatory Environment**

-banking, insurance, and securities industries are heavily regulated

#### **1. Function of Central Bank**

-founded in 1913

#### ***4 Areas of Federal Reserve Duties***

1. conduct the nation's monetary policy

2. supervise and regulate banking institutions and protect the credit of consumers

3. maintain the stability of the financial system

4. provide foreign financial services to the US government, public, financial institutions, and foreign official institutions

#### ***Extras***

#### **1. appointments to the board**

-7 members selected by President confirmed by Congress; 14 year terms; can serve only 1 full term; President appoints 2 members to be chairman and vice chairman for 4 year terms

#### **2. representation**

-1 member of board from each of the 12 districts; must represent full economic spectrum

#### **3. responsibilities**

-primary responsibility of formulation of monetary policy

-other 5 members of the FOMC are president's from the 12 district banks, 1 being the New York President; the other 4 serve staggered 1 year terms; by tradition the FOMC selects its own organization, although they always select the board chairman as theirs and the New York president as the vice chairman

-the board set reserve requirements and shares responsibility with member banks for discount rate policy; these plus FOMC make up monetary policy of the FED

-also has regulatory power over all banks in the US; controls the payment systems, and issues credit legislation

#### **4. meetings**

-meets several times a week in accordance with Government in the sunshine Act; but if sensitive financial information is discussed the meetings are closed to the public

#### **5. contracts within governments**

-meet other agencies, governments, academics, and anybody they see to

### ***2 Main Foreign Central Banks***

#### **1. Bank of International Settlements BIS**

- interacts solely with central banks and government agencies; central bank for central banks

- does research, policy, counterparty, and facilitation

- world's oldest international financial institution, 1930

- head office is in Basel Switzerland and satellite offices in Hong Kong and Mexico City

## **2. European Central Bank ECB**

- central bank for the euro; many countries participate

- second largest economic area in the world

- same objectives as task as any central bank

## **2. Function of Insurance Regulators**

- insurance industry is regulated by: state, federal, and government agencies

### **4 Main Bodies/Regulations**

#### **1. McCarran-Ferguson Act 1945**

- established primacy of states in insurance regulation; gives states primacy, but allows federal to intervene if Congress deems necessary

- allows insurers to share information to reduce business costs

- provides insurers exemption from federal anti-trust laws as long as they are state regulated

- explicitly empowers states to tax and regulate insurance

#### **2. State Insurance Commissions**

- each state must have one; each state's commission holds power over the insurance companies; each state appoints an insurance commissioner

- handles all duties: licensing, taxing, regulations, complaints, hearings

#### **3. National Association of Insurance Commissioners NAIC**

- nongovernmental organization comprised of state commissioners

- created in 1871 to coordinate regulation of multi-state insurers

- 50 states, DC, and 4 territories

- no direct regulatory authority, but encourages uniformity in bills and legislation for the insurance consumers

- established minimum resource levels needed for efficient regulation; set up a peer review system; set up 4 pools in the US with examiners from each state

- examiner in charge from insurance company's home state; if more than 1 million in premiums or 20% of overall sales that zone may participate also; every 3 to 5 years; reviews are public records

#### **4. Securities and Exchange Commission SEC**

- has regulatory authority over investment products

- some insurance products as well, because they are speculative: annuities, variable life insurance, variable universal life; non-guaranteed products

- sellers must comply with the federal laws; agents must be registered with the SEC and NASD and their state

#### **3. Function of Securities Regulators**

- several regulations have been developed

### **6 Regulations**

#### **1. SEC Act 1933**

- first securities legislation; designed to ensure complete information for investors

#### **4 Parts**

**1. registration requirements-** S-1 statement and prospectus; S-1 includes all company info

**2. SEC review process-** at least 20 days (cooling off period); issues either deficiency letters, stop orders, or an effective date

**3. preliminary prospectus-** before SEC acceptance; must acknowledge it is a preliminary and information could change

**4. exempt securities-** specifically exempts some securities from registration: government securities; commercial paper <270 days; railroads airlines (Interstate Commerce Act); nonprofits; fixed annuity contracts and insurance policies; regulation A (1.5 million or less); regulation D; Rule 147 (intrastate rules, only sold to residents of that state)

## **2. SEC Act 1934**

-secondary markets regulation while 1933 act was for new issues

-SEC commissioners are appointed by president and confirmed by Senate; serve 4 year terms and are prohibited from business and stock activity during that time\

### **5 Parts**

**1. registration requirements-** the exchanges and those working for them must register with SEC; some small and local exchanges do not have to

**2. credit regulations-** members of exchanges or broker-dealers can't borrow on any listed security, except through a Fed Reserve Bank; can't have total debt 15 times their net capital; do not apply to exempt securities like government obligations

**3. manipulation and deception-** can't short sell or solicit if a member; or any other fraud

**4. insider rules-** can't trade before info is public; must file personal statements with SEC within 10 days of transactions; can't short sell; 10% of shares, officers, anyone else

**5. proxies-** must be accurate and submit a copy to SEC\

## **3. Investment Company Act and Advisors Act 1940**

-instituted to ensure investors are fully informed and treated fairly

-3 types of investment companies: unit investment trusts (1 security), face amount certificates, management companies (hedge funds)

-requirements: sponsors must invest at least 100,000 prior to public offering; 40% of board must be outsiders; typical elections and fees oversight

## **4. National Association of Securities Dealers Rules**

-established as part of 1934 Act to regulate the OTC market

-all broker-dealers involved with interstate commerce or transactions with national exchanges must register with the NASD

-recommendations must be fair, supervision and documentation required; detailed records kept usually

### **4 Parts**

**1. registered representative rules-** any person who solicits or conducts business in securities is a registered representative; gifts over 100, continuing education, keep records for 3 years, reviews at any time, if leave for 2 years must retake tests

**2. conduct of customer account rules-** protect customers from unsubstantiated or undocumented losses; need approval for penny stocks, reviews and such

**3. trading and market rules-** to provide a consistent and equitable method to sell and purchase securities

**4. communications with the public-** similar to NYSE rules; make sure information is fair accurate and not misleading

-complaints can be filed and have a specific process they go through

### **5. Municipal Securities Rule Making Board**

-MSRB created in 1975 to develop rules to govern the municipal securities market  
 -15 member board; focuses on creating regulations for banks, brokers and dealers involved in municipal activities; does not regulate municipal issuers, just the participants  
 -relies on other agencies to enforce the rules: FED, FDIC, SEC, NASD, others

#### **4 Parts**

**1. registered representative rules-** Rule G-2 requires all parties effecting municipal transactions to be qualified; determined by passing an exam

**2. conduct of customer account rules-** similar to others; assess the background info of the client before making a recommendation; all new accounts must be approved in writing

**3. trading and market rules-** typical rules

**4. advertising and other rules-** rules pertaining anything disseminated to the public

#### **6. Margin Lending**

-margin (loan value is opposite), hypothecation, rehypothecation,

\***Regulation U-** limits total borrowing amounts

\***Regulation G-** limits amounts non-bankers can lend to brokers for rehypothecation

\***Regulation T-** limits the amount brokers can lend on certain securities

-special margin requirements: margin calls, accrual of interest, written agreement, regulation T

-long market value (total costs, including commission), debit balance (amount of loan), equity (customer's account net worth), restricted accounts, industry requirements, maintenance calls, special memorandum accounts

## Laws and Regulations

### 1. Equal Credit Opportunity/Antidiscrimination

-Regulation B: credit for all; prevents discrimination; banks must provide notices of action

### 2. Home Mortgage Disclosure

-Regulation C: provides public with loan data to help in making decisions and identifying discrimination

### 3. Reserve Requirements

-Regulation D: relates to the amount of reserves banks must keep with the Fed; either vault cash or balance at the Fed

### 4. Insider Transactions

-Regulation O: relates to prohibitions against providing preferential treatment to banking industry insiders

### 5. Lending Disclosure

-Regulation Z: truth in lending; notifies consumers of credit policies and fees; allows them to cancel certain agreements in a timely manner

### 6. Deposits Disclosure

-Regulation DD: truth in savings; enables consumers to make informed decisions about accounts at depository institutions

### 7. Real Estate Sales Disclosures

-Regulation 34: sets forth standards for real-estate related lending and associated activities by national banks

### 8. Self-assessment of Internal Controls/Risk Management

-SOX 404; all public firms must submit a statement of internal controls annually; each report must state responsibilities of management and assess controls

-auditors must assess to this; and there must be an adoption of a code of ethics

### 9. Investor/Depositor Protection

-GLB act included a consumer privacy aspect

-must give consumers privacy notices and the explain the institution's information sharing guidelines; consumers can restrict some, but not all of their information

-makes a distinction between consumers and customers (long-time consumers);

customers get yearly notices, but consumers get it only if their information is shared

-privacy notice must be clear and concise and mailed or somehow delivered

-can opt out of sharing with other institutions, but only certain information with their affiliates; no opt out when essential services like IT is being provided

-the banks can sell this information if the customer does not opt out

### 10. Financial and Personnel Information Privacy

-Regulation P: privacy of consumer financial information; governs the treatment of non-public personal information

-HIPPA addresses some of these things too for medical issues

### 11. Anti-money Laundering

-Bank Secrecy Act 1970 made banks know their customers and keep documents for criminal prosecution

**Regulation A- Borrowing by Depository Institutions**

-relates to extensions of credit by Fed Reserve Banks to depository institutions and others; established rules under which the Fed banks can extend credit to depository institutions and others

-allows: adjustment (short-term), extended (long-term), and emergency (economic issues) credits

**Regulation B- Equal Credit Opportunity Act**

-prohibits discrimination and must give notice of: action, credit collections of information, retention of credit information, race for certain dwellings, copies

**Regulation C- Home Mortgage Disclosure Act**

-provides public with information, help public officials distribute public-sector investment to attract private sector investment, and to help identify discriminatory practices

-requires certain lenders to track home loans and refinancings

**Regulation D- Reserve Requirements**

-relates to reserve requirements; also provides guidance on NOW account eligibility, MMDA and savings account transfer restrictions, and early withdrawal penalties

**Regulation E- Electronic Funds Transfer Act**

-protects consumers using EFT; establishes basic right, liabilities, and responsibilities of consumers of financial institutions using EFT

**Regulation F- Limitations on Interbank Liabilities**

-limits the risks that the failure of a depository institution would have on other depository institutions; provides requirements relating to interbank liabilities

**Regulation G- Disclosure and Reporting of CRA-related Agreements**

-disclosure and reporting of CRA-related agreements

**Regulation H- Membership of State Banking Institutions in the Federal Reserve System**

-provides guidance on a variety of matters relating to state-chartered member banks, from real estate lending standards to standards for safety and soundness

**Regulation I- Issue and Cancellation of Capital Stock of Federal Reserve Banks**

-implements the provisions of the Federal Reserve Act relating to the issuance and cancellation of Federal Reserve Bank stock or ceasing to be a member bank, or upon changes in the capital and surplus of a member bank of the Fed

**Regulation J- Collection of Checks and Other Items**

-governs the collection of checks and other cash and non-cash items and the handling of returned checks by the Fed Reserve Banks and provides rules for collecting and returning items and settling balances

**Regulation K- Edge Act**

-sets out rules governing the international and foreign activities of US banks, including procedures for establishing foreign branches and Edge corporations to engage in international banking and for investments in foreign organizations

**Regulation L- Interlocks Act**

-designed to foster competition in the banking industry by limiting the sharing of banking personnel; management official can't serve in a management capacity of 2 institutions in the same community

**Regulation M- Consumer Leasing**

-implements the consumer lending provisions of the Truth in Lending Act

**Regulation N- Relationships with Foreign Banks and Bankers**

-governs relationships and transactions between Federal Reserve Banks and foreign banks or groups of foreign banks, or bankers, or a foreign state

**Regulation O- Loans to Executive Officers**

-governs extensions of credit to insiders, which includes directors, officers, and principal shareholders of a bank and its affiliates; includes special restrictions on loans to executive officers

**Regulation P- Bank Protection Act**

-requires a financial institution to provide notice to customers about its privacy policies and practices, describes the conditions under which a financial institution may disclose non-public personal information about consumers to non-affiliated 3<sup>rd</sup> parties; and provides a method for consumers to prevent a financial institution from disclosing that information to most non-affiliated 3<sup>rd</sup> parties by opting out of that disclosure

**Regulation Q- Interest on Deposits**

-provides guidelines and restrictions relating to interest on deposits and advertising

**Regulation S- Reimbursement for Providing Financial Records**

-establishes the rates and conditions for reimbursement of reasonably necessary costs directly incurred by financial institutions in assembling or providing customer financial records to a government pursuant to the Right to Financial Privacy Act

**Regulation T- Credit by Brokers and Dealers**

-regulates extensions of credit by brokers and dealers; it imposes, among other obligations, initial margin requirements and payment rules on certain securities transactions

**Regulation U- Credit by Banks for Purchase of Margin Stocks**

-imposes credit restrictions upon persons other than brokers or dealers that extend credit for the purpose of buying or carrying margin stock if the credit is secured directly or indirectly by margin stock

**Regulation V- Fair Credit Reporting**

-implements provisions of the Fair Credit Reporting Act FCRA; includes model notices that can be used to notify customers either before or immediately following the delivery of negative information

**Regulation W- Transactions Between Member Banks and Their Affiliates**

-implements Sections 23A and 23B of the Federal Reserve Act which govern most transactions between banks and their affiliates; the term banks includes all national banks, as well as insured state member and nonmember banks, and for certain purposes, US branches and agencies of foreign banks

**Regulation Y- Bank Holding Company Act**

-regulates the acquisition of control of banks by companies and individuals; defines and regulates the nonbanking activities in which bank holding companies and foreign banking organizations with US operations may engage; and sets forth the procedures for securing approval for these transactions and activities

-the Bank Holding Company Act of 1956 was designed to control interstate banking activities by requiring that the state being expanded into specifically allowed the formation of an interstate bank

**Regulation Z- Truth in Lending**

-designed to help consumers comparison shop for credit by requiring disclosures about its terms and cost; gives consumers the right to cancel certain credit transactions that involve a lien on a consumer's principal dwelling, regulates certain credit card practices, and provides a means for fair and timely resolution of credit billing disputes; also requires a maximum interest rate to be stated in variable-rate contracts secured by the consumer's dwelling; imposes limits on certain home equity and mortgages

**Regulation AA**

-establishes consumer complaint procedures; defines unfair or deceptive acts or practices of banks in connection with extensions of credit to consumers; prohibits certain practices, such as taking a non-purchase money security interest in household goods

**Regulation BB- Community Reinvestment Act**

-purpose is to assess an institution's record of helping to meet the credit needs of the local communities in which the institution is chartered, consistent with the safe and sound operations of the institution, and to take this record into account in the agency's evaluation of an applicant for a deposit facility by the institution

**Regulation CC- Availability of Funds and Collection of Checks**

-contains rules regarding the duty of banks to make funds deposited into accounts available for withdrawal, including availability schedules plus rules regarding exceptions to the schedules, disclosure of funds availability policies, payment of interest, and liability; contains rules to expedite the collection and return of checks by banks, including the direct return of checks, the manner in which the paying bank and returning banks must return checks to the depository bank, notification of non-payment by the paying bank, endorsement and presentment of checks, same-day settlement for certain checks

**Regulation DD- Truth in Savings**

-purpose is to enable consumers to make informed decisions about accounts at depository institutions; requires depository institutions to provide disclosures so that consumers can make meaningful comparisons among depository institutions

**Regulation EE- Netting Eligibility for Financial Institutions**

-expands the FDIC Improvement Act of 1991 definition of a financial institution for financial market participants who avail themselves of the netting provisions of the Act regarding contracts in which the parties agree to pay or receive the net, rather than the gross payment due

**Regulation FF- Obtaining and Using Medical Information in Connection with Credit**

-extends the rules on obtaining and using medical information in connection with credit to creditors other than those regulated by the OCC, FRB, FDIC, OTS, NCUA

**Regulation X- HUD**

-implements the provisions of the Real Estate Settlement Procedures Act RESPA

**Banking Laws**

**1. National Bank Act 1864**

-established a national banking system and the chartering of national banks

**2. Federal Reserve Act 1913**

-established the Federal Reserve System as the central banking system of the US

**3. McFadden Act 1927**



-amended national banking laws and the Federal Reserve Act; prohibited interstate banking

#### **4. Banking Act 1933**

-Glass-Steagall Act; established FDIC as temporary agency; separated commercial banking from investment banking

#### **5. Banking Act 1935**

-established the FDIC as a permanent agency of the government

#### **6. FDIC Act 1950**

-revised and consolidated earlier FDIC legislation into 1 act; embodied the basic authority for the operation of the FDIC

#### **7. Bank Holding Company Act 1956**

-required Federal Reserve Board approval for establishment of a bank holding company; prohibited bank holding companies headquartered in 1 state from acquiring a bank in another state

#### **8. International Banking Act 1978**

-brought foreign banks within the federal regulatory framework; required deposit insurance for branches of foreign banks engaged in retail deposit taking in the US

#### **9. Financial Institutions Regulatory and Interest Rate Control Act 1978**

-FIRIRCA; created the Federal Financial Institutions Examination Council; established limits and reporting requirements for bank insider transactions; created major statutory provisions regarding electronic fund transfers

#### **10. Depository Institutions Deregulations and Monetary Act 1980**

-DIDMCA; established NOW accounts; began the phaseout of interest rate ceilings on deposits; established the Depository Institutions Deregulation Committee; granted new powers to thrift institutions; raised deposit insurance to 100,000

#### **11. Depository Institutions Act 1982**

-Garn-St. Germain; expanded FDIC powers to assist troubled banks; established the New Worth Certificate Program; expanded the powers of thrift institutions

#### **12. Competitive Equality Banking Act 1987**

-CEBA; established new standards for expedited funds availability; recapitalized the Federal Savings & Loan Insurance Company FSLIC; expanded FDIC authority for open bank assistance transactions, including bridge banks

#### **13. Financial Institutions Reform, Recovery, and Enforcement Act 1989**

-FIRREA; purpose was to restore public confidence in savings and loan industry; abolished the Federal Savings & Loan Corporation FSLIC, giving the FDIC the power of insuring savings and thrifts; SAIF for thrifts and BIF for banks; abolished the Federal Home Loan Bank Board, created Federal Housing Finance Board FHFB and the Office of Thrift Supervision OTS to replace it; created Resolution Trust Corporation RTC as a temporary agency for managing and disposing of failed banks; Resolution Funding Corporation RFC created to fund it

#### **14. Crime Control Act 1990**

-title XXV, Comprehensive Thrift and Bank Fraud Prosecution and Taxpayer Recovery Act 1990, greatly expanded the power of Federal regulators to combat financial fraud; prohibited golden parachutes from underfunded banks; increased fines and penalties for bank fraud, gave regulators power to recover assets diverted during bank frauds, and allowed FDIC to take presumptive action

**15. FDIC Improvement Act 1991**

-FDICIA; increased the powers of the FDIC; recapitalized the BIF allowed the FDIC to borrow from the Treasury; created Truth in Savings; ordered a least-cost resolution method for failing banks; restricted brokered deposits and solicitation of deposits and non-banking activities of insured state banks

**16. Housing and Community Development Act 1992**

-established regulatory structure for government-sponsored enterprises GSE, combated money laundering, and provided regulatory relief to financial institutions

**17. RTC Completion Act**

-requires the Resolution Trust Corporation RTC to adopt a series of management reforms and to implement provisions for bitches and niggers; lengthened statutory time for lawsuits, and provided for the transfer of RTC assets to the FDIC in 1995

**18. Riegle Community Development and Regulatory Improvement Act 1994**

-established a Community Development Financial Institution Fund for funding for CDFIs; -aims at curbing reverse redlining, which is targeting insufficient people with abusive loans; relaxed capital requirements to encourage private sector secondary market trading of small business loans; reduces bank regulatory burden and paperwork requirements; reduces amount of currency transactions filed by financial institutions; shores up the Federal Flood Insurance Program

**19. Riegle-Neal Interstate Banking and Branching Efficiency Act 1994**

-permits bank holding companies to acquire banks in any state after 1 year enactment requirement; increases statute of limitations for RTC

**20. Economic Growth and Regulatory Paperwork Reduction Act 1996**

-modified flow of credit regulations for businesses and consumers; amended Truth in Lending Act and Real Estate Settlement Procedures Act 1974 to streamline mortgage lending process; amended FDIA to reduce regulatory burden and cost of credit; amended Fair Credit Reporting Act to strengthen consumer credit reporting protection; improved consumer credit repair protections; clarified lender liability and federal agency liability issues under the CERCLA; allowed FDIC to levy special assessment for recapitalization of SAIF

**21. Gramm-Leach-Bliley Act 1999**

-Financial Services Modernization Act; repeals last vestiges of Glass-Steagall Act 1933; allows super banks with restrictions on non-financial activities; restricts disclosure of non-public customer information by financial institutions, allows opt-out clauses by customers; banks need a satisfactory CRA rating to be formed; eased membership and restrictions for Federal Home Loan Bank System FHLB

**22. International Money Laundering Abatement and Financial Anti-Terrorism Act 2001**

-prevents terrorists and others from using US financial system to move funds; provides for greater scrutiny for foreign banks with deposits and foreign persons with deposits; makes banks impose anti-money laundering standards and requires greater participation with the government in money laundering cases

**23. SOX Act 2002**

-established PCOB; prohibits firms from providing other services to those they audit; requires CEOs and CFOs to verify financial statements; SEC can issue rules governing

audits; insiders cannot trade stock during pension fund blackout periods; whistleblower protections and a ban on alteration of documents

**24. Fair and Accurate Credit Transactions Act 2003**

-FACT contains amendments to the FCRA and helps prevent identify fraud and identifying victims; enhances consumer rights with regards to their credit; offers free credit reports to customers, and provides opt-out clauses

**25. Office of Foreign Assets Control**

-OFAC of the US Department of the Treasury administers and enforces trade sanctions based on US foreign policy and national security goals relating to 'drugs' nukes and terrorists; acts under presidential wartime and emergency powers, and by special legislation to freeze assets; works with UN and international mandates

## Stock Exchanges and Other Markets

-brokers and dealers have separate functions; dealers must have inventories of all securities, usually called specialists and deal in 1 stock; make their money off the spread  
 -brokers are the middleman between the public and dealers; make their money from commissions

-dealers can't interact with the public except in OTC markets, where they are called broker-dealer firms

-negotiable securities are traded initially on the primary market; most go OTC initially

### **4 secondary markets**

1. first- NYSE
2. second- NASDAQ; OTC
3. third- 24 hours a day trading for 1<sup>st</sup> markets
4. fourth- direct trading between institutions without brokers; reduces costs

### **Types of Orders**

-order is the mechanism that is used by a registered representative of a broker to execute the trade; order tickets are used which are comprehensive

1. market orders- immediately at market price
2. limit orders- specify a price
3. stop orders- prices to limit losses on short and long positions
4. stop limit orders- must be filled at limit price or better

### **Types of Offerings**

1. primary
  2. secondary
- clearing and settlement process; must be in good form

### **Settlement Dates**

1. regular way- stocks and bonds; 3 days after transaction date
2. cash- same day, before 2:30 ET
3. US government securities; next day
4. options- 3 days beyond request of buyer or seller
5. whens, As, and if issued WAI- 3 days after certificate issues; new issues

### **The Stock Exchanges**

#### **1. how they function**

- has a board with a full-time chairman; NYSE has 1366 seats; individuals only, no partnerships or corporations
- categories of memberships: commission house brokers, floor brokers, bond members, registered traders
- specific listing and delisting requirements

#### **3 Tape Networks**

-stock transactions are shown on a consolidated tape within seconds of transaction; information is submitted by selling broker and includes shares and price

1. network A- NYSE; includes regional exchanges and 3<sup>rd</sup> and 4<sup>th</sup> markets
2. network B- AMEX and regional exchanges NYSE and AMEX

3. consolidated quotation services- OTC

**2. specific NYSE rules**

-many different rules so brokers do not have unfair advantage over the public

**3. regional exchanges**

-just have smaller volumes

**4. OTC market**

-any stock may be traded OTC

-OTC prices are negotiated not bid on the floor

**3 Levels of Quotes**

1. level 1- retail customers; provides highest bid and lowest offer

2. level 2- listing for all market makers and their current bid and offers

3. level 3- for use of market makers and permits entry of their current quotes

-listing is less stringent, but rules still do apply

**5. options market**

-includes: long (buyer), short (seller), premium, expiration date, strike or exercise price, call option, put option

-use breakeven analysis to value options; does not include brokerage fees

**Insurance**

**1. Overview**

-functions of the insurance regulators

**2. Laws and Regulations**

1. Reserve Requirements

2. Financial and Personal Information Privacy

3. Self-assessment of Internal Controls/Risk Management

4. Securities and Exchange Commission

**Securities**

1. Overview

**2. Laws and Regulations**

1. Reserve Requirements

2. Insider Transactions

3. Self-assessment of Internal Controls/Risk Management

4. Investor Protection

5. Financial and Personal Information Privacy

6. Anti-money Laundering

# Taxation

## **I. Federal Tax Procedures and Accounting Issues**

Filing Status and Exemptions, Filing Requirements and Penalties

Accounting Methods & Periods, and Computations of Tax Liability & Tax Credits

## **II. Federal Taxation of Property Transactions**

Taxation of Gifts, Estates and Fiduciaries, and Exempt Organizations

## **III. Federal Taxation- Individuals**

Income- Inclusions and Exclusions

Deductions for Adjusted Gross Income

Deductions from Adjusted Gross Income

## **IV. Federal Taxation- Entities**

Capital Transactions

Partnerships

C Corporations

Distributions, S Corporations and Other Corporate Matters

Corporate Distributions and Other Matters

S Corporations

## **V. State Taxation**

# I. Federal Tax Procedures and Accounting Issues

## Filing Status and Exemptions, Filing Requirements, Penalties

### 1. Individual Taxation

-essentially is gross income – deductions = taxable income

### 2. Filing Status

-single or unmarried; married filing jointly, married filing separately, head of household, qualifying widower with dependent child

### 3. Standard Deductions

-qualifying widower and married filing jointly have greatest deduction; then head of household; then single or unmarried and married filing separately

-additional standard deduction for taxpayers over 65 or that are blind

### 4. Exemptions

-second deduction is the exemption

#### 2 Types

#### 1. personal exemption

-1 per person, unless married; but the spouse can't claim as well is filing separately; no exemption allowed for taxpayer claimed as a dependent on another tax return

#### 2. dependency exemption

-5 requirements for qualifying as a dependent: support test, gross income test, relationship test, joint return test, citizenship test

-must meet all requirements

-exceptions: multiple support agreements, support of divorced or separated parents, gross income of dependent children under 19, gross income of dependent children under 24, filing of joint return

### 5. Filing Requirements

-individuals must file a tax return if their gross income is a certain amount; this level represents the appropriate standard deduction plus exemption amount

-if you make more money than the total of your exemptions and deductions, you must file

-for married filing separately the filing threshold is for the exemption amount only

### 6. Statute of Limitations

-may request extensions of up to 6 months

- government can audit the return at any time during the 3 year period; same time taxpayer has to amend a tax return as well
- when there is an understatement of gross income by 25%, the statute increases from 3 to 6 years
- fraudulent returns have no statute of limitations
- failure to file a tax return means the statute never begins
- requesting refunds of prior taxes paid, statute is generally 3 years; 7 years for bad debts or worthless security's

### **7. Preparer Responsibilities**

- generally recognized stuff is the preparer's responsibilities; can have procedural penalties for 50 for not signing or furnishing copies; larger penalties for wilfully understating income
- for tax research, must: identify the issues; locate the authority (IRC, revenue rulings, regulations, court cases); communicate the results



## Accounting Methods & Periods; Computations of Tax Liability and Tax Credits

### 1. Accounting Methods

-may report income under method used for books, unless IRA doesn't like it

-cash, accrual, or hybrid method

**\*constructive receipt-** income is recognized when money or property is made available to taxpayer and there are no real limitations to receiving it

**\*instalment sales-** if payments occur in years other than that of sale, prorata is used; can opt out and declare all immediately with an opt out declaration

-when the project extends beyond the tax year the completed contract method can be used; % of completion method can be used, similar to instalment sales

### 2. Accounting Periods

-year end can be whenever you want, just have to file with IRS and notify them; the income from the short period must be annualized to determine the appropriate effect

### 3. Computation of an Individual's Tax Liability and Credits

-tax is computed from taxable income; after deductions from AGI

-less credits and plus other taxes

-credits: child and dependent care credit, child tax credit, elderly tax credit, education credits, foreign tax credits, withholding taxes, estimated tax payments, earned income credit, excess social security tax

-other taxes: self-employment tax, AMT, penalty tax on IRAs and pensions

-if taxpayer has taxable income less than \$100,000, they may use the tax tables

-if dependent children have to file returns, they can take no personal exemption; limited to earned income

**\*kiddie tax-** when children under 14 have net unearned income in excess of \$1,600, the excess is taxed at the parent's rate

-as income increases many deductions and exemptions become phased out or eliminated

-farmers may use income averaging to determine their tax; may include gain sale from farming business property in their income

### 4. Alternative Minimum Tax

-ensures individuals pay their fair share of tax; is the excess of the tentative minimum tax over the regular tax

-includes 4 parts: adjustments (positive-subtracted or negative-added), tax preferences (always added to taxable income, never subtracted), exemption amount (differs by filing status), AMT tax rate (tentative minimum tax)

-for example, MACRS will increase the AMT, but when the assets is fully depreciated, MACRS will decrease the AMT; different depreciation methods

### 5. Self-Employment Tax

-if earnings from self-employment are at least \$400, self-employment tax must be paid

-is equal to the employee's and employer's share of the social security and medicare withholding taxes

**6. Computation of Tax Credits**

- generally reduce the amount of tax shown on the return
- most are nonrefundable as well which they means they can only reduce the tax to 0
- includes: earned income credit, child tax credit, educational tax credits (Hope scholarship and lifetime learning credit), dependent care credit, adoption credit, retirement savings contribution credit, elderly credit, foreign tax credit, and excess social security tax credit

**7. Estimated Income Tax Payments**

- individual's must make estimated payments if they expect that the underpayment after withholdings and tax credits is at least \$1,000 and more than 10% of the amount of the tax shown on the return
- payments are due throughout the year and differ based on tax year

# II. Federal Taxation of Property Transactions

## Taxation of Gifts, Estates and Fiduciaries, and Exempt Organizations

### 1. The Transfer of Wealth

-to avoid the estate tax, people will transfer assets before their death; these transfers are subject to the gift tax

### 2. The Tax Reform Act 1976

-in 1976 Congress combined gifting of assets and estates laws; taxpayers are assessed a progressive rate on a taxable rate and cumulative gifts

-unified credit is available for small estates; 780,000 for an exemption amount of 2,000,000

### 3. Estate Taxation

-gross estate includes FMV of property and right to control property

-deductions are allowed for expenses and debts of the estate

\***estate tax liability**= gross estate – allowable deductions= taxable estate + taxable gifts = tentative tax base = tentative unified transfer tax – gift taxes paid – unified credit and other credits = estate tax liability

-estate can be valued at date of death or 6 months later; any property distributed prior to alternate date is valued at death date

-when death occurs within a year of gift, and gift reverts back, no change in basis; no step-up in basis

-if married 50% of property is included; sometimes life insurance is included

-various allowable deductions such as unlimited marital and expenses

-unified credit is 780,000 on the first 2,000,000; other credits as well

-estate return is due within 6 months of death; not required if estate is less than 2,000,000, minus any gifts made during their lifetime

### 4. Gift Taxation

-a gift is made out of detached generosity; nothing is expected in return

-taxpayer may deduct up to 12,000 per year per donee

-gifts between husband and wife are fully excluded; may split gifts

-for gift tax purposes FMV is used; for income tax purposes adjusted basis is used

-gifts directly to institutions and hospitals are not taxable

-unified transfer tax (gift tax) is cumulative and progressive

-need not file a return unless gifts to certain entities require it

**5. Income Taxation of Fiduciaries**

- until investments have been distributed after death, tax must be paid on their income
- trusts may have to pay tax too; simple trust (distributes all its income) does not have too; complex trust (does not distribute) has to pay taxes and is allowed the deduction as well
- amount of income that is taxable is the distributable net income, not distributed net income
- may choose calendar or fiscal year end

**6. Taxation of Exempt Organizations**

- some organizations are exempt: schools, churches, US government, social clubs, condominiums, business clubs, private foundations
- must apply for exempt status
- can have income as long as it is related to its exempt purposes; bingo qualifies
- tax on unrelated business income UBI over 1,000 applies
- private foundations have specific requirements as well
- exempt organizations must file yearly as well

**7. Unified Tax Transfer Rates**

- for gifts and inheritances; differs based on how much is transferred

# III. Federal Taxation- Individuals

## Income- Inclusions and Exclusions

### 1. Gross Income

-includes everything; several main types

### 2. Employee Compensation

-some is fully taxable (primary salary and benefits), some is fully excluded, and some is partially excluded

-employee fringe benefits: health insurance premiums and benefits; group-term life insurance; death benefits; cafeteria plans; employee discounts; de minimis fringes; moving expense reimbursement; reimbursed expenses; qualified transportation benefits; qualified employer-provided educational assistance; dependent day care and adoption expenses

### 3. Interest Income

-municipal interest, educational savings bonds, and veterans administration insurance dividends are not included in gross income

-US Savings bonds interest is, but may be deferred

### 4. Dividends

-dividends from stocks represents gross income, but is taxed at long-term capital gains tax rates (lower)

-dividends from life insurance policies and stock dividends are not included in gross income; stock dividends are of there is an option to receive cash or other assets instead of the stock

### 5. Rents and royalties

-amounts received from rental properties less expenses

-royalties and such are fully includable

-if improvements made in lieu of rent, improvements are includable

### 6. Self-Employed Business Income

-income on an unincorporated basis; services as consulting and tax returns and such

### 7. Alimony and Separate Maintenance Agreements

-deductible and reportable; child support is not taxable to the recipient

-division of property is not taxable

-mortgage payments are not included as gross income

\***alimony recapture**- when alimony payments are front-loaded for tax savings

-alimony is earned income to the recipient when considering IRA contributions

### 8. Full Inclusion

-gambling winnings, jury duty pay, unemployment compensation are all included in gross income

**9. Partial Exclusion or Limitations**

-social security benefits, annuity contracts and pensions, tax benefit rule, prizes and awards, discharge of indebtedness, foreign income, armed services, qualified tuition programs

**10. Full Exclusion**

-inheritances and gifts, life insurance, personal injury, scholarships, rental value of parsonage (minister housing allowance)

## Deductions for Adjusted Gross Income

### 1. Classification of Deductions

- some deductions look to adjusted gross income as a threshold instead of gross income
- 3 types of adjusted gross deductions- general, self-employed, and passive

### 2. General Deductions

- IRA's- if the taxpayer's spouse is an active participant in an employer provided plan, the deduction may be disallowed
- for the IRA to be deductible, it must be paid during the taxable year or by due date of the return; individuals can contribute to IRAs until they are 70; 10% penalty for early withdrawal, but is ignored if for education or first-time home
- Roth IRAs are not deductible, but have fewer restrictions
- others: coverdall education savings account CESA; moving deductions, penalty on early withdrawal of savings, alimony deduction, jury duty pay, student loan interest, tuition and fees deduction, educator expenses

### 3. Self-Employed Taxpayers

- may deduct all necessary and ordinary expenses paid in carrying on their trade or business
- examples: business meals and entertainment (50%); business gifts (\$25 max per year); club dues and membership fees (not allowed); substantiation (\$75 or more); personal expenses (not allowed)
- hobby loss rules state that there cannot be pleasure in it to be considered a self-business
- casualty loss deductions are fully deductible; not subject to \$100 floor and 10% AGI for personal casualty loss
- deduction allowed for cost recovery and depreciation expense; bonus depreciation allows for extra 30% depreciation in the first year
- section 179 elections allows for immediate expensing up to \$105,000 of property instead of capitalizing and depreciating it
- amortization is allowed over 15 year life
- deduction allowed for 1/2 of self-employment tax paid
- deduction is allowed for 100% of the cost of premiums paid for medical insurance by the self-employed taxpayer in 2006
- deduction allowed for contributions made to the self-employed taxpayer's qualified retirement plan
- deduction allowed for contributions to health savings accounts

### 4. Passive Activity and Rental Losses

- losses to passive activities are allowed only to the extent of passive gains
- any trade or business activity where the taxpayer doesn't actively participate
- all rental activities are unless they are the taxpayer's primary business
- at risk rule takes precedent over all other rules; if a taxpayer is not at risk for a loss, not loss is allowed

## Deductions From Adjusted Gross Income

### 1. Standard v. Itemized Deductions

-can save more itemizing deductions; several types qualify for itemizing

### 2. Medical Expenses

- medical expenses paid for diagnosis, cure, mitigation, treatment, or prevention of disease, or for the purpose of affecting any structure or function of the body
- paid for taxpayer or dependent and exceed 7.5% of AGI
- deductible medical expenses must be reduced by insurance reimbursements
- deductions for capital expenditures are deductible only to the extent they don't increase FMV (elevators)
- deductions for nursing homes and special schools are allowed; transportation and lodging for these are deductible as well
- can't be claimed for itemized if was claimed a deduction for AGI

### 3. Taxes

- deduction allowed for state, local, and foreign taxes paid during the year
- no deductions for federal taxes except for special situations; must be the taxpayer's liability
- deductible taxes: state and local, real estate, personal property taxes, foreign taxes

### 4. Interest Deduction

- deductions allowed for payments of qualified residence interest and investment interest
- interest on personal indebtedness is not allowed as a deduction
- qualified residence interest and investment interest expense
- for qualified residence: acquisition indebtedness, home equity indebtedness, points for loans, and penalties are fully deductible; refinancing costs are not full deductible

-interest on borrowings for tax-exempt securities are non-deductible

### 5. Charitable Contributions

- to any qualified charity; contributions cannot exceed 50% AGI for the year
- requires written substantiation or credit card receipts

### 6. Casualty Losses

-personal casualty losses include thefts, and are deductible; 100\$ floor and 10% AGI rules apply

### 7. Miscellaneous 2% Deductions

- miscellaneous employee related expenses are deductible to the extent they exceed 2% of AGI
- other miscellaneous: gambling losses (to extent of winnings); impairment related work expenses; unrecovered investment in an annuity; federal estate tax on income in respect of the decedent

### 8. Limitation on Deductions

-if AGI exceeds 75,250 or 150,00, then cutback is lessor of 3% of excess AGI over threshold amounts or 80% of allowable itemized deductions



# IV. Federal Taxation- Entities

## Capital Transactions

### 1. General Rule

- realized gains are usually recognized, but sometimes not
- amount realized (profit) and adjusted basis (cost)
- long-term capital gains are taxed at a lower rate
- net all short term and long term transactions together
- losses aren't recognized for related part transactions; but if the property is then sold for again, the loss will offset the gain
- wash sales for securities sold and bought within 30 days; losses are disallowed
- trade date is used for tax purposes, not the settlement date
- section 1244 stock is small original issue stock; most long-term capital gains only allow 3,000 in capital losses per year; but 1244 allows 100,000 in ordinary losses and unlimited capital losses
- worthless securities are treated as long-term capital losses usually
- business bad debts are treated as losses to ordinary income

### 2. Basis Computations

- property received by inheritance FMV
- property received by gift FMV; allow for deductions for gift tax
- stock dividends- most are nontaxable and valued at FMV; are taxable if you have the option of other property instead

### 3. Non-Taxable Transactions

- like-kind transactions recognize no gain or loss; real property for real; personal for personal
- any extra is considered boot and is taxed; recognized gain cannot exceed realized gain however
- sale of principal residence is deductible up to 250,000 or 500,000; must be there at least 2 years unless for job or health, and can repeat over the lifetime
- involuntary conversions: flood and fire; no gain is recognized from insurance if they are reinvested in similar property within 2 (personal property) or 3 (real property) years

### 4. Recapture Rules

- defines any gains from capital property due to depreciation claimed
- \***personal property**- depreciation gains are attributable to ordinary income
- \***real property**- excess of MACRS over straight line is gain from depreciation
- if the property is held for less than a year, all depreciation is recaptured as ordinary income, not just the excess

### 5. Capital Assets and Section 1231 Assets

-allows for depreciation recapture when depreciated property is sold; if gain is recognized it is a capital gain; if loss is recognized the loss is ordinary

## Partnerships

### 1. Nature and Characteristics

- 2 or more people or entities
- is not a taxpaying entity but a conduit through which everything flows down to the partners
- 4 types: general partnership; limited partnership; limited liability partnerships LLP; limited liability company LLC
- organization and syndication fees are capitalized and amortized
- selling costs of the partnership are not deductible or depreciable
- tax years is governed by a strict basis, so 1 partner can't change his tax year relevant to another partner's

### 2. Formation- Contributions of Property

- no gains or losses recognized on transfer of property to partnership from a partner
- no gains or losses recognized when asset is contributed with a liability; just the partner's tax basis of the contributing partner
- partner must recognize as ordinary income the FMV of interest received for any services rendered for a partnership stake; the partner's basis in the partnership will be equal to the amount of income recognized

### 3. Operations of the Partnerships and Basis Computations

- each year the partnership must report each partner's balances and group all the items into separately stated and non-stated items
- separately stated refers to those items that would make a tax difference if grouped together with the individual claims; all items not separately-stated are netted together to 1 line
- after that the income or loss can be allocated to partners
- allocation of income items is first; income items cause an increase in the partner's interest, while losses lead to a reduction; interest can not fall below 0
- if more loss exists than current basis, then the deductions must be prorated for future periods
- \***guaranteed payments**- salary expense, not withdrawal of capital; similar to pre-distribution of ordinary income; subject to self-employment tax, along with partner's share of ordinary income; no effect on basis- increase for income and decreases for distribution
- partner's are at risk, so liabilities increase their basis; non-recourse liabilities result in no increase in basis
- partner's withdraw money at the end of year in anticipation of earnings; do not represent income to partner, and are not taxed, but they do reduce his basis
- when computing the balance in a partner's account, withdrawals are subtracted out before losses and deductions are; if a partner withdraws more than the balance in the capital account, the excess will be treated as capital gains

### 4. Dealings Between the Partners and Partnership

- generally not treated as related party

-if a partner owns 50% of a partnership's capital, losses even at arm's length are disallowed

-if a partner owns more than 50% of a partnership's capital, any gain from the sale of property between the partnership and partner must be recognized as ordinary income; if the property is a capital asset, it is a capital gain

### **5. Sale or Exchange of a Partnership Interest**

-when a partner sells his interest, the difference between the amount realized and the adjusted basis of interest represents the gain or loss

-usually recognized as capital gain; but if hot assets, those for ordinary income, are sold, then the gain must be ordinary income

### **6. Distributions to Partners**

-for non-liquidating distributions, distributions of assets less than adjusted basis reduce the adjusted basis correspondingly, and those greater than adjusted basis reduce it to 0

-no gains or losses were recognized at contribution, just basis change as well

-for liquidating distributions, the basis or interest is terminated; when cash only, gains or losses will be recognized

-when for cash and property, cash reduces the basis first, then the property assumes the remaining basis; if there is basis remaining after cash, no loss or gain is recognized

-if the property includes 751 assets, these come after cash; if not enough basis exists, capital loss is recognized; if not, there is no gain or loss recognized

### **7. Termination of a Partnership**

-2 events signal termination: no activity of any sort continues to be carried on; within a 12 month period there is a sale or exchange of 50% or more of the total interest in partnership capital and profits

## C Corporations

### 1. Nature and Characteristics

-a corporation is a separate taxpaying entity; has its own rate structure, files its own return, and makes its own elections apart from stockholders

**\*check the box regulation-** any person or group of persons can choose sole proprietorship, partnership, or corporation; if not checked, sole proprietorship for single person and partnership for 2 or more people

-fees relating to organization, accounting and legal, are capitalized and amortized

-fees relating to issuance of stock and securities are neither deductible or amortizable; expensed in the period incurred

-no special rules for election of tax year; special rules for Personal Service Corporations and S corporations

### 2. Formation- Contributions of Property

#### 4 Instances

1. when property is transferred for stock, no gain or loss is recognized if shareholder retains control, at least 80% or corporation; there is a carryover of basis to the corporation of the property as well as carryover of basis to the shareholder's stock in the corporation

2. when property is exchanged for stock and other property, the other property is considered boot; gain or loss is realized and recognized on the boot

3. when property is transferred that has liabilities, no gain or loss is recognized; amount of liabilities assumed by the corporation reduces the tax basis of the contributing shareholder; if the assumption of the liabilities is greater than the shareholder's basis in the property, the excess over the basis is considered boot and will result in a gain to the shareholder

4. when a shareholder receives stock in exchange for services, the shareholder recognizes ordinary income to the extent of the FMV of the stock received; shareholder's basis in the corporation will be equal to the amount of income recognized

### 3. Taxation of a Corporation

-follows similar path as individual taxation; but not standard deductions or personal exemptions

#### 4 Special Deductions and Limitations

1. charitable contributions- timing and limitations are different; 10% of taxable income; forward 5 years

2. net operating losses- back 2 years and forward 20 years

3. capital gains and losses- treated as ordinary income; may not deduct capital losses; carried back (3 years) and forward (5 years) as short-term

4. dividends received deduction- prevents triple taxation; 70%, 80%, 100%

-other corporate differences: keyman life insurance, bad debts, manufacturer's deduction

### 4. Dealings Between the Shareholders and Corporation

-for small shareholders, transactions are treated as arm's length transactions and not related party

-if he owns more than 50%, all losses are disallowed; any gains are capital or ordinary

**5. Book to Tax Conciliation- Schedule M-1**

-book income must be converted to taxable income; just identify those items of income and deduction which differ from book to tax

**\*add:** federal income taxes, excess capital loss (carried forward), excess charitable contributions (carried forward), keyman life insurance premiums, disallowed municipal interest expense, disallowed business meals and entertainment expenses, non-deductible penalties

**\*subtract-** municipal interest income, keyman life insurance proceeds, allowable capital loss carryforward from prior years, allowable contribution carryforward from prior years

**6. Analysis of Unappropriated RE- Schedule M-2**

-similar to reconciliation of book income to tax

**\*increases-** NI plus any refund of prior year's tax

**\*decreases-** dividends paid and reserves for contingencies and other appropriations

**7. Net Income Reconciliation- Schedule M-3**

-for consolidation of financial statements and income and taxes

## Distributions, S Corporations, and Other Corporate Matters

### 1. Computation of Corporate Tax Liability and Credits

-tax is computed based on taxable income

\***minus**: credits foreign taxes or business credits; estimated tax payments

\***plus**: AMT; personal holdings tax; environmental tax

-15%, 25%, or 34% tax rates; surcharges of 1% can raise these up to 35%

### 2. Alternative Minimum Tax

-similar to individual Amt to ensure payment of fair share of taxes

-determine the various tax adjustments or preferences which were properly elected and planned for, and effectively disallow them

-repealed for small corporations SC; annual gross receipts less than 5 million

\***AMTI**: taxable income after adjustments and preferences

#### AMT adjustments

-can be positive or negative, depending on timing

-depreciation, circulation expenditures, differences in recognized gains or losses, pollution control facilities amortization, passive activity losses, completed contract method, incentive stock options, net operating loss

-no adjustments needed for itemized deductions since corporations have none

#### Tax preferences

-always added, never subtracted

-interest income on passive activity bonds, excess depreciations, % depletion beyond property's adjusted basis, excess intangible drilling costs

#### ACE adjustment

-adjustment equal to 75% of adjusted current earnings ACE over AMTI before ACE adjustment is required

-similar to earnings and profits; brings corporation's income to economic reality

-can be positive or negative; negative adjustment can only be to the extent of the positive adjustment; any unused ACE adjustments cannot be carried forward

-interest income on other tax-free bonds other than private activity, life insurance proceeds, LIFO inventory adjustment, depreciation, 70% dividends reduction (not 80% or 100%), amortization expense of organization costs

#### Exemption amount

-exemption amount for corporations is 40,000; phased out at a rate of 25% over excess if the corporation's AMTI before the exception exceeds 150,000

-gives the AMT base; \* 20% tax rate = tentative minimum tax; less regular tax = AMT tax

### 3. Environmental Tax

-is .12% of the excess of the corporate modified AMT income over 2,000,000

### 4. Tax Credits

1. **foreign tax credit**- foreign income/worldwide income \* US taxes= pro rata share

-cannot exceed lesser of foreign taxes paid or pro rate share

**2. general business credit-** greater of 25% of regular tax liability that exceeds 25,000, or the tentative minimum tax; 1 year carryback and 20 year carryforward

**3. work opportunity tax credit and welfare to work credit-** encourages employment of target groups: economically disadvantaged youths convicts and Vietnam vets, vocational rehabilitation referrals, qualified summer youth employees

-40% of first 6,000 of wages paid and 35% of first 10,000 of wages paid

**4. research credits-** encourages research in the US; incremental and base research credits; 20% over a base amount

**5. disabled credits-** available to small businesses; 50% of eligible disable access expenditures that exceed 250; maximum is 5,000

### **5. Estimated Income Tax Payments**

-if expected tax is more than 500, the corporation must make 4 estimated payments each year

-payments must equal: 100% of current and prior year's tax; annualized income instalment method computation

### **6. Controlled Groups**

-individual owning multiple corporations for tax benefits

-allowed: 1 surtax exemption; 1 section 179 election amount; 1 accumulated earnings credit to be allocated; 1 40,000 AMT credit to be allocated

#### **2 Types**

1. parent-subsidiary controlled group

2. brother-sister corporations- parent owns multiple subsidiaries

### **7. Consolidated Returns**

-have the option of filing consolidated returns, don't have too

-advantages: offset losses, defer income on intercompany transactions, elimination of intercompany dividends

-disadvantages: deferral of intercompany losses until the property is sold to an outside party



## Corporate Distributions and Other Matters

### 1. Non-Liquidating Distributions to Shareholders

- general rule is that a distribution made to a shareholder with regard to its stock is considered dividend income
- FMV of property is used
- dividends are taxable to the extent of the earnings and profit of the company; E&P is similar to RE, represents ability to pay dividends
- when the distribution exceeds available E&P, the excess represents a return of basis in stock; if that amount exceeds basis, then it is a capital gain
- E&P has 2 parts: accumulated and current; depending on which one is negative or positive determines where the distribution to shareholders comes from
- when the corporation distributes cash, no gain or loss is recognized and the distribution reduces E&P
- when the corporation distributes appreciated property, excess of FMV over its basis is treated as gain; income recognizes increases current E&P and the FMV of the distribution then reduces E&P
- E&P must be brought up to date before the determination of how the distribution is taxable can be made

### 2. Liquidating Distributions to Shareholders

- shareholder's stock is returned to corporation in exchange for assets; similar to what began the corporation, but there is a tax on the gain or loss recognized; both shareholder and corporation recognize a gain or loss
- treated at FMV as ordinary or capital gain
- when the shareholder is another corporation 80% owned by the parent, no gain or loss is recognized; the basis of the assets being transferred becomes the basis to the parent as well as any extras
- any liquidation fees are expensed; any asset specific fees reduce gains from those items

### 3. Reorganizations

- when stock or securities of 1 corporation are exchanged for stock securities or assets of another corporation, the transaction may qualify for tax-free if they are "party to a reorganization."
- benefits of reorganizations include: carryover of unused tax attributes such as net operating losses

#### 7 Types

1. Type A- statutory merger or consolidation; stock for assets, then stock distributed
2. Type B- stock for stock
3. Type C- stock for asset; but just substantially all of the assets, not all of
4. Type D- spin-offs or split-offs
5. Type E- recapitalization or change to the capital structure
6. Type F- change in identity, form, or place of the organization
7. Type G- assets transferred to another corporation in bankruptcy

### 4. Personal Service Corporations

- will classify as PSC when its primary occupation is services and its owners/employees own more than 10% of stock
- must usually use calendar end, can use fiscal sometimes
- limited in deductions and taxed at the highest marginal tax rate

### **5. Personal Holding Companies**

- corporations receiving dividends get to deduct 70%-100% of dividends; individuals do not
- restrictions apply to individuals using closely held corporations to shelter unearned income
- a personal holding company is assessed a tax penalty of 15% on its undistributed personal holding company income UPHCI; in addition to regular income tax
- if 9 or fewer stockholders, or if unearned income is 60% or greater, is a PHC
- no deduction is allowed for dividends received deduction, but for federal income taxes, charitable contributions, and dividends paid; some restrictions on dividends paid
- self-assessed tax, unlike the accumulated earnings tax

### **6. Accumulated Earnings Tax**

- to avoid double taxation (dividends), corporations accumulate their earnings; penalty tax on unreasonable accumulated earnings
- penalty rate is 15% of accumulated taxable income ATI; in addition to regular tax rate
- to get taxable income:
  - \***minus:** charitable contributions over 10% limit, capital loss adjustment, federal income taxes, dividend paid deduction, accumulated earnings credit
  - \***plus:** dividends received deduction, net operating loss, capital loss carryover on carrybacks
- \***dividends paid reduction**- up to 2.5 months after year; shareholders may consent to a dividend by filing a form; this means no money is distributed, but income is recognized by shareholders and a corresponding contribution to capital is recorded; consent dividend increases dividend paid deduction and prevents the IRS from assessing the penalty
- \***accumulated earnings credit**- greater of reasonable needs of the business less the accumulated earnings and profits or 250,000 less the accumulated earnings and profits of prior years
  - for certain businesses like consulting, architecture, and accounting minimum credit is 150,000 not 250,000
  - reasonable needs include: working capital, loans, lawsuit reserves, debt retirement,...
  - cannot be imposed on a personal holding company; no minimum shareholder requirement
  - IRS assessed tax, unlike personal holdings company tax

## S Corporations

### 1. S Corporations

-same as corporation, just taxation changes similar to that of a partnership

#### *Requirements*

1. maximum of 100 shareholders; family members can be 1 shareholder; partnerships, corporations, certain trusts, and non-resident aliens cannot hold stock
2. 1 class of stock; can still have voting and non-voting
3. debt is not another class of stock; safe harbour for under 10,000 loan to shareholders
4. if passive income is greater than 25% of total, prior to forming, can't elect for S status
5. all shareholders must consent in writing 1 time
6. revocation of S status may be voluntarily or involuntarily; must wait 5 years to elect again

### 2. Operations of the S Corporation and Basis Computations

-must report each shareholder's allocable share of income, deductions, gains, and losses and credits; group items in separately states and non-separately stated

-same procedures for stating items and netting as for partnerships

-income items are allocated first and increase basis; losses and non-deductible items cause reductions and may need to be pro-rated for future years

-unlike partnerships, S corporations may claim a deduction for compensation paid to the shareholders; fringe benefits don't count, like health insurance for owners

-major difference from partnerships is that shareholder's basis is not increased for loans they are personally responsible for; but if they lend money to the corporation, their basis is increased by that amount; a repayment of shareholder's loan reduces the shareholder's tax basis

-withdrawals are not taxed as income, but do reduce basis in the stock; when computing the balance in a shareholder's account, withdrawals are subtracted out before losses and deductions are

-if more is withdrawn than basis, excess is treated as capital gains; these withdrawals are viewed as dividends; so shareholders should only withdraw equal to their proportionate share of stock

### 3. Built-In Gains Tax

-an S corporation who recently changed from C corporation may be subject to a built-in-gains tax for the appreciation of assets not yet realized, up until the point of conversion from C to S; the character of the gain recognized will be the basis of the underlying assets when the assets are sold

# Economics

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Optimum Currency Areas and European Experience

The Global Capital Market: Performance and Policy Problems

Developing Countries: Growth, Crisis, and Reform

## 11. Basic Concepts of Economics

- human nature has unlimited desires; scarcity of resources
- individuals must spend their limited income
- economy must allocate fixed resources for the best of the society
- 3 systems: capitalistic, socialist, communist
- what and how much, how, for whom
- micro and macro economics

## 12. Demand

- quantity of goods and services consumers are willing and able to purchase
- is a function and not a quantity; entire schedule of prices and quantities
- at a single price do we say quantity demanded at that price

### Law of Demand

- price of a product is inversely related to the quantity demanded
- demand schedule, or demand curve, graphically represents this relationship between price and quantity
- changes in price cause a movement along the demand curve
- changes in any other determinants cause a shift or movement of the demand curve; 5 others
- normal goods, inferior goods, substitute goods, complementary goods

### *Determinants of Demand*

#### 1. price

#### 2. consumer income

\***income effect**- individuals buy more when they have more income

\***normal goods**- purchases increase as income increases

\***inferior goods**- purchases decrease as income increases

-income elasticity of demand determines whether the good is normal or inferior

#### 3. prices of related goods

-substitute and complementary goods

#### 4. consumer expectations

-about future prices

#### 5. consumer tastes and preferences

-help determine normal and inferior; society can change

#### 6. number of consumers

-more consumers more supply and demand



### 13. Elasticity of Demand

\***price elasticity of demand**- % change in quantity demanded / % change in price

\***elastic goods**- 1% change in price leads to a more than 1% change in quantity demanded

-price elasticity of demand will be greater than 1; sensitive to changes in price

\***inelastic goods**- 1% change in price leads to a less than 1% change in quantity demanded

-not sensitive to changes in price; price elasticity of demand is less than 1

#### *Classifications of Elasticity*

\***perfectly inelastic**- quantity demanded remains the same no matter the change in price

\***inelastic**- smaller change in quantity demanded than price

\***unitary elastic**- same change in quantity and price

\***elastic**- larger change in quantity demanded than price

#### *Factors Affecting Elasticity*

1. luxury or necessity
2. % of consumer income
3. number of substitutes
4. time period considered

### 14. Supply

-supply curve is the amount producers are willing to supply at different quantities

#### **Law of Supply**

-in the short run, there is a positive relationship between price and quantity

-supply schedule, or supply curve depicts this graphically

-as with demand curve, movement along supply curve occurs when there is change in price

#### *Determinants of Supply*

-cause a movement or shift of the supply curve

1. production prices
2. number of firms producing the good
3. prices of complements and substitutes
4. price expectations
5. taxes and subsidies
6. changes in technology

#### **Elasticity of Supply**

\***price elasticity of supply**- responsiveness of a change in the quantity supplied to the change in price

= % change in quantity supplied / % change in price

-can use the % method or the midpoint or arc method

#### **Factors Influencing Price Elasticity of Supply**

1. cost of storage- high costs of storage cause a inelasticity of supply
2. production process- longer the less elastic
3. time-more elastic in the long run

\***market supply**- sum of every individual selling firms' supply curves

## 15. Market Equilibrium and Pricing

-market refers to the interaction between sellers and buyers

**\*market equilibrium**- point where the demand curve intersects with the supply curve

-any points above or below will be unstable

-in the long-run in a competitive market, the equilibrium price will be equal to the marginal cost of production

### Price Fixing

-occurs when an artificial price is set in the market

-usually done by a government and is typically harmful; illegal for firms to do it

#### 1. price ceilings

-sets a maximum price, leading to a shortage when prices drop

#### 2. price floors

-minimum price is set; leads to a surplus when prices rise

#### 3. price supports

-sort of like a floor; leads to a surplus

-government pays suppliers to make the good

## 16. Macroeconomics

-concerned with the economy as a whole

-study the determination of and movements in national income, employment and exchange rates (price of money)

-the study of economy wide aggregates and averages

-average level of prices CPI; total output GDP

## 17. National Income Accounting

-measures to evaluate the output of an economy

### Gross Domestic Product GDP

-most commonly utilized

**\*GDP**- equal to total market value of all final goods and services produced within a country during a certain time period

-can be foreign or national, just produced within the borders

-equal to either the total income or total expenditure; expenditures equal income

-must include each item only once: either final sale or value added by a producer

**\*real GDP**- adjusted for inflation; risen 5 fold in the US since 1990

### 2 Measures

#### 1. Income Approach

- 4 main components and 2 adjustments

1. wages

2. rents

3. net interest

4. profits

5. indirect business taxes minus subsidies

6. depreciation; capital consumption

-must subtract any foreign incomes

## **2. Expenditure Approach**

-measures the amount spent to purchase the year's output

$$\text{GDP} = C + I + G + (X - M)$$

-C is personal consumption expenditures; I is gross private domestic investment; G is governmental purchases; X is exports; M is imports

### ***Not the Best Measure of Economic Health***

1. GDP levels must be adjusted for changes in price levels
2. may change because of population; use per capita GDP
3. not adjusted for changes in values of leisure activities
4. non-market transactions are excluded from the calculation
5. transactions that are not official do not appear; underground economy

## **Gross National Product GNP**

-total income of the nationals; all citizens and companies

$$\text{GDP} - \text{net foreign income factor} = \text{GNP}$$

### ***Other Measures***

#### **1. Net Domestic Product NDP**

-GDP adjusted for depreciation

$$\text{GDP} - \text{capital consumption allowance (depreciation)} = \text{NDP}$$

#### **2. National Income NI**

-adjusts for indirect business taxes, like sales tax

$$\text{NDP} + \text{net foreign earned income} - \text{indirect business taxes} = \text{NI}$$

-must add back foreign earned income however; like GNP

#### **3. Personal Income PI**

-amount of income households and noncorporate businesses receive

#### **4. Disposable Income DI**

-amount of money households and non-corporate businesses have to spend after taxes

$$\text{PI} - \text{P income taxes} = \text{DI}$$

**\*discretionary income-** amount of income to spend after that on essentials

## **18. Aggregation of the National Economy**

### **Aggregate Demand**

-aggregate demand curve shows how a change in the price level will change aggregate expenditures on goods and services in an economy

-all of the businesses, individuals, and governments demand together

### ***3 Reasons Downward Sloping***

1. wealth effect- when prices fall, each dollar buys more
2. interest-rate effect- people have more money from lower prices, they deposit more
3. international effect- as prices fall, goods become cheaper to the world and exports increase

### ***Affected By***

1. foreign income
2. exchange rates
3. expectations
4. distribution of income

5. monetary and fiscal policies

### **Aggregate Supply**

-shows how much quantity of output an economy will supply at various prices in short-run

#### ***Determinants***

1. input prices
2. productivity
3. legal and institutional environment

#### ***3 Shapes***

-prices are flexible (changing) in the long run and sticky (constant) in the short-run

1. long-run supply curve- vertical line; price has no impact on quantity
2. short-run supply curve- horizontal line; prices do not change quickly
3. intermediate term supply curve

-in the short-run, falls in aggregate demand lead to falls in aggregate supply; because as firms cut costs to combat lost sales revenue from lower demand, they will reduce scope

-shocks to aggregate demand: changes in money supply, expectations about profits

-shock to aggregate supply: oil or new technology

## **19. Economic Growth**

-economic growth is the rate of change of GDP

-becomes the real economic growth rate when adjusted for inflation

-economic and societal goal to have continuous growth

### **Production Possibility Curve**

-shows all possible combinations of output a country has

-cannot produce outside its PPC, but can get there through international trade

-if can't supply more, prices will be bid up resulting in inflation or shortages

#### ***Long Run Shifts***

1. increases in productive resources
2. increases in supply or stock of capital goods
3. technological advancements
4. international specialization and trade

-more efficient use of resources will not shift, just more resources

-demand must also increase for growth to be realized

-trade deficits allow the company to live outside, but increase the debt held by foreigners; trade surpluses are opposite

## **20. Business Cycles**

-fluctuations in the general level of economic activity; measured by real GDP or unemployment

### ***Phases***

#### **1. recovery (expansion)**

-interest rates rise, employment expands; 2 quarters

#### **2. peak**

-turns from expansion to recession

**3. recession (contraction)**

- GDP declines 2 successive quarters
- severe long lasting is a depression
- caused by: overextension of credit; speculation in securities; excess saving over investment

**4. trough**

- turns from recession to expansion

***Economic Indicators***

- successful policy stabilization requires future predictions
- indicators are variables with high correlations to aggregate economic activities; help to evaluate whether current monetary and fiscal policies should be contractionary or expansionary

**1. Leading**

- 11: average workweek for production workers, prices of 500 common stocks, average weekly initial unemployment claims, new orders for consumer goods and materials, contracts and orders for plant and equipment, building permits for homes, vendor performance, M2, changes in inventory on hand, changes in sensitive material prices, changes in credit outstanding for consumer and business borrowing

**2. Lagging**

- to help improve economic models for the future
- 7: average duration of unemployment (weeks), change in index of labour cost per unit of output, average prime rate charged by banks, ratio of manufacturing and trade inventories to sales, commercial and industrial loans outstanding, ratio of consumer instalment credit outstanding to personal income, corporate profits

**3. Coincidental**

- 4: employees on nonagricultural payrolls, personal income minus transfer payments, industrial production, manufacturing and trade sales

**21. Measurements of Inflation**

- level by which prices are rising or purchasing power is falling

***4 Measures*****1. Consumer Price Index CPI**

- calculated every month; measures inflation by pricing a typical basket of household goods and services over time
- =2002 price/2001 price \* 100; rate of change in inflation

**2. Wholesale Price Index WPI**

- producer price index
- broken down into components by commodity, industry sector, and stage of processing

**3. GDP Deflator**

- index of price level of total output compared to a base year; takes inflation out of GDP

**4. Real v. Nominal Variables**

- price indexes convert nominal variables into real variables
- in inflationary economy, nominal will be higher than real

## 22. Unemployment and the Economy

-% of the labour force unemployed

\***labour force**= £ employed + £ unemployed

\***unemployment rate**= £ unemployed/ labour force \* 100

\***miserable index**- unemployment rate + inflation rate

### *Types*

1. frictional- job search
2. structural- geography and skills; regional and technological
3. cyclical- economic downturns
4. seasonal- seasonal business

### **Costs**

-economic costs include lost output that results from those unemployed not working  
 -non-economic costs results from individual and social degradation; loss of implicit income

-full employment occurs when cyclical unemployment is 0; exists even when some potential workers are unemployed

\***natural rate of employment**- rate which economy will gravitate to in the long run

-sum of frictional and structural

-unemployment can never be 0; around 4% in the US

## 23. Inflation and the Economy

-2 types

\***cost push**- increase in production costs

\***demand pull**- excess of demand over supply for goods and services

-many costs result from inflation

### **Redistribution Effects**

-it hurts: creditors, fixed income groups, individuals who save

### **Inflation v. Unemployment**

-not really related

\***Phillips curve**- depicts short-run trade offs between inflation and unemployment; vertical in long run, indicating no relationship

## 24. International Trade

-can be political or social reasons for trade barriers

-government creates artificial barriers to cause imported goods to be more expensive

### *Types*

1. tariffs- antidumping tariffs; Uruguay Round
2. import quotas; embargos; if local production is competitive, no need for quotas
3. domestic content rules- % of the good made locally
4. exchange controls- manipulation of exchange rates
5. export subsidies- payments to producers to export
6. voluntary export/import quotas

### **Economic Effects of Trade Barriers**

- country now produces goods it can't as efficiently; shift resources from other goods to less efficient ones
- net effect of this is an increase in prices, decline in total benefit received by the consumers

### **Measures to Avoid Trade Barriers**

- develop special interest groups or set up groups like NAFTA

## **25. Comparative Advantage**

- whole world has more goods to consume; each country produces more efficiently at a lower price a specific good
- whichever food can be produced cheaper gives that country comparative advantage
- Establish Acceptable Ranges
- each country will require different units of 1 good for another

## **26. Absolute Advantage**

- 1 country can produce everything best
- 1 country will still have comparative advantage in production of 1 of the goods
- may not lead to complete specialization, because the less efficient country may not be able to produce enough of the good it has a comparative advantage in for the rest of the world
- PPC is the graphical representation of this; for good on horizontal axis, the country with a flatter PPC has comparative advantage, and for the good on the vertical axis, the country with a steeper PPC has comparative advantage
- if 2 PPC's are parallel, both countries have the same advantage in each good; comparative advantage is the same

## **27. International Accounts and the Balance of Payments**

- record payments to other countries and payments received from other countries

### **2 Principal Accounts**

#### **1. Current Accounts**

- short-term current transactions
- export and import of goods and services; interest and dividends received and paid on foreign investments; unilateral transfers- foreign aid, remittances, pension payments
- similar to a revenue account; debits for imports and credits for exports

#### **2. Capital Account**

- long-term transactions, including financial (stocks and bonds) and real (plant and equipment)
- the surplus or deficit will increase or decrease the country's official reserves

### **Corrective Measures**

1. set import quotas
2. encourage domestic producers to increase export
3. develop domestically produced substitute products
4. devaluation of currency

5. other- automatic correlation; free-floating exchange rates

## 28. Foreign Currency Markets and Currency Rates

- most macroeconomic models assume a closed economy
- there can be dramatic effects when the currency is not valued properly

### Exchange Rates

- for international trade to occur, the currencies must be easily convertible
  - effects of depreciation and appreciation can be dramatic for balance of payments
- = £ euros 1<sup>st</sup> date - £ euros 2<sup>nd</sup> date / £ euros for 1\$ at 1<sup>st</sup> date

## 29. Determination of Exchange Rates

### 4 Types

#### 1. Floating, flexible

- when foreign demand for US goods increases, dollar appreciates
- when US demand for foreign goods increases, dollar depreciates
- purchasing power parity should hold in the long run; exchange rates will automatically adjust until the prices for similar goods is the same in all countries; not always hold true
- in the medium term the exchange rate is determined by the economies; recession v. expansion
- in the short-term exchange rates are affected by interest rates in the 2 countries; as the interest rates rise, more investors will want to hold that currency

#### 2. Fixed

- government must maintain large foreign currency reserves to maintain the fixed rate; to buy and sell its own currency to maintain the rate
- when it is too low, the government's currency will be undervalued and will have to spend it itself in the world markets and will build up foreign reserves; exports are cheap
- when it is above free market value, it is overvalued
- a major reason for devaluing a country's currency is to improve their balance of payments

#### 3. Managed Float

- mixture of fixed and floating; the government doesn't set the rate but can strongly influence it; most westernized countries

#### 4. Gold Standard

- if the spot rate is more than forward rate, the dollar is selling at a discount
  - if the spot rate is less than the forward rate, the dollar is selling at a premium
- = forward rate – spot rate / spot rate \* £ forward periods in a year
- if local currency is expected to appreciate, collect receivables as soon as possible and delay payments as long as possible
  - if local currency is expected to depreciate, delay receivables collections and speed payments of payables



## 2. Government and the Economy

-2 tools are monetary policy and fiscal policy

### 3. Monetary Policy

- FED established by an act of Congress to be separate from the federal government
- for the economy to be healthy, the money supply should grow as fast as the economy
- goal is to achieve a full-employment, noninflationary level of total output

#### Fed Reserve System

- directed by a board of governors; 7 members appointed by the President
- the board is responsible for administering monetary policy and running the banking system; equal to a Central Bank
- chairman and vice-chairman appointed every 4 years; rest serve 14 year staggered terms
- FED is divided into 12 geographical districts
- functions include: control the money supply, check collection, fiscal agent of the US government, supervise banking system, hold reserve deposits for member institutions
- federal funds market has developed for federal funds rate to other member banks; overnight borrowing; fed funds rate is the interest on these loans

#### 3 Main Tools

##### 1. open market operations

- most important
- purchase and sale of government securities (bonds and notes) on the open market
- purchases are expansionary and sales are contractionary

##### 2. reserve requirements

- infrequently used, but powerful
- reserve ratio is the % of deposits banks must have; lowering this increases the amount of money available for circulation

##### 3. discount rate

- rate at which member banks may borrow from the Fed
- lowering it increases the money supply
- minor tools: moral suasion, persuasion; margin requirements; selective credit controls

#### Aspects of

- inflation must be controlled; prices cannot rise when there is no money available
- now firms can borrow abroad and can borrow on credit
- recognition lag is the time it takes to recognize a downturn in the economy
- monetarists' favour letting the economy work itself out, because attempts to eliminate fluctuations just increase the effects of those, and they aren't felt until later
- tight policy reduces the money supply and increases unemployment

#### 4. Money Supply

-must analyze money supply and demand

-money can be: medium of exchange or store of value

\***velocity of circulation**-  $\times$  of times a year average dollar changes hands to buy goods and services before it is taken out of circulation

##### Definitions of Money

M1- narrow money; all money in immediately spendable forms

M2- broad money; includes money markets, savings accounts, small time deposits

M3- widest measure; large time deposits, institution money markets, eurodollars

##### Short-term Demand

-demand for money is based on how much money people want to hold as cash and not in the bank getting interest

##### 2 Determinants

###### 1. interest rates

-money supply is fixed in the short run

-when interest rates are high, high opportunity cost to holding money; so people will deposit it into banks to loan out for more assets

-cause movements along the demand curve

###### 2. level of income

-as income rises, people will want more money to make transactions

-cause shifts of the demand curve

\***liquidity preference function**- demand curve for money; inverse relationship between interest rates and the demand for money

-interest rate and money demand graph

#### 5. Fiscal Policy

-interaction of taxation and government expenditure

-can increase expenditure or decrease taxes to expand the economy

-price and GDP graph

##### Government Budget Surplus (Deficit)

-excess of government tax collections over government transfers and purchases

-Keynesian economics say fiscal policy should be expansionary when in recession

-thus, deficit spending is the result of expansionary fiscal policy; can lead to inflation

\***budget deficit**= cyclical deficit + structural deficit

-cyclical deficit is caused by the downturn in the economic cycle; government receives less in tax and pays out more in social security

-structural deficit is the normal deficit at full unemployment; caused by government spending more than it receives in tax

-under the Full Employment Act of 1946, the government assumed responsibility for full employment; can enter markets as it sees fit

\***transfer payments**- government transfers of money in the form of negative taxes designed to redistribute income; Medicare, foodstamps, welfare, unemployment compensation

##### 2 Consumption Goods

-used to analyze the government's role in the marketplace

1. public- services to the public; highways, military

2. private- allow only 1 individual to benefit  
 \***spillover benefits**- when people receive unintended benefits from a private sector good  
 -why the market may not allocate goods efficiently

## 6. Government Funding

### 2 Ways Government Raises Money

#### 1. debt financing by the government

-more beneficial to consumers because: individuals lend their money and get returns; debt payments spread out over time so future generations share

2 effects of debt financing: crowding out effect (slows economy); crowding in effect (speeds economy)

#### 2. taxes

-more burdensome on the US economy; primary measure

#### *Methods of Taxation*

1. benefits received- tolls used, public parks

2. ability to pay- taxes are paid when you have money; cash basis, not accrual; progressive

#### *Tax Rate Structure*

1. progressive tax- as income increases, so do taxes; need an inflation measure

2. proportional tax- same tax paid by all; Russia

3. regressive tax- higher income, lower % of income paid as tax; sales taxes

\***marginal tax rate**- tax rate charged to the next dollar of income; progressive system, marginal is higher than existing rate

\***average tax rate**- total tax liability / total taxable income

\***effective tax rate**- total tax liability / total economic income ; includes munis interest

\*direct taxes- imposed on taxpayer and paid directly to government; income taxes and social security

\***indirect taxes**- levied on goods and services; sales tax and employer paid social security

\***incidence of taxation**- person who actually pays for the tax; property taxes result in higher prices to consumers; windfall tax is a onetime on output, to contrast

\***value added tax VAT**- tax on the value that a business adds to the good it sells; difference between sales and purchased inputs of the company

-every company collects on what it sells and pays on what it purchases; remitted to government

-regressive tax; tax of consumption, so people with lower income pay a higher % on it

-revenues and expenses are reported excluding VAT, unless it is unrecoverable and thus can be capitalized and amortized

-ultimately paid by the consumer in the form of higher taxes

## CMA

**Microeconomics**

- unlimited desires with a scarcity of resources
- individuals have limited income, the economy has to allocate limited resources
- what, how much, how and for whom to be produced
- microeconomics is the interaction between the individual and the firm
- demand increases, curve shifts right, outward

- movement along an existing curve happens when price changes*
- change in determinants causes a shift in curve*

**Determinants of demand**

- 1) consumer income- income effect; normal and inferior goods
- 2) prices of related goods- substitute and complimentary goods
- 3) consumer expectations-
- 4) consumer tastes and preferences
- 5) number of consumers

**Elasticity**

- 1) **% method**-  $E = \frac{\% \text{ change } Q}{\% \text{ change } P}$
- 2) **Midpoint or Arc method**-  $\frac{(Q_2 - Q_1) / (Q_2 + Q_1) / 2}{(P_2 - P_1) / (P_2 + P_1) / 2}$

Perfectly inelastic, 0; inelastic, <1 (unresponsive); unitary elasticity, 1; elastic, >1 (responsive)

Demand curve is elastic at the top and inelastic at the bottom

**Factors affecting elasticity**

- 1) luxury or necessity good; luxury more elastic
- 2) % of consumer income required to purchase good; higher more elastic
- 3) time period considered; longer more elastic, can find substitutes
- 4) number of substitutes; less more inelastic

$$ED * P = Q$$

$$TR = P * Q$$

Cross and Income elasticity of demand- normal vs. inferior goods

**Theory of demand**

**Utility theory**- consumers want to maximize their utility; marginal utility

**Indifference curves**- consumers wants and preferences; 2 goods

-slope is the MRS (marginal rate of substitution)

**Budget constraints**- consumers real income and what able to buy

-slope is straight line; determines indifference curve

-consumers equilibrium position is on the utility maximization graph

-cardinal (utils) vs. ordinal measures

**Determinants of Supply**

-in the short run, producers will supply more as the price increases

- 1) production prices
- 2) number of firms

- 3) prices of complementary and substitute goods
- 4) price expectations
- 5) taxes and subsidies
- 6) changes in technology

### **Factors affecting Elasticity**

- 1) cost of storage
- 2) production process
- 3) time

- market supply is the sum of all individual's firms supply curves
- market equilibrium is where the supply and demand curves intersect
- when supply and demand curves move in same direction, we can determine new Q but not new P
- when supply and demand curves move in opposite directions, we can determine new P but not new Q

- externalities and spillovers
- price fixing, ceilings, floors, and supports
- economic costs are explicit and implicit
- accounting costs are just explicit
- accounting profit is TR- Explicit costs
- economic profit is TR – Economic costs

### **Implicit costs**

- 1) interest lost
  - 2) lost accounting profit- opportunity cost
  - 3) normal profit- opportunity cost
  - 4) economic depreciation- market value
- economic rent is the extra you get; exclusivity
  - stop production where  $MR=MC$
  - derived demand is demand of all inputs to production
  - \***nominal**= current prices
  - \***real**= adjusted for inflation
  - marginal analyses is used to determine what one more input will cause
  - long run all costs are variable costs
  - economies vs. diseconomies of scale

### **Market Structure**

- 1) Perfect competition
  - competitive firms make 0 economic profit in the long-run
- 2) Monopolistic competition
  - prices higher and output levels lower than perfect competition
- 3) Oligopoly
  - kinked demand theory
- 4) Pure and natural monopoly
  - makes positive economic profit in long term

**Antitrust Regulation**

- 1) Sherman Act of 1890
- 2) Clayton Act of 1914
- 3) Federal Trade Commission Act of 1914
- 4) Robinson Patman Act of 1936
- 5) Cellar-Kefauver Act of 1950
- 6) Antitrust Improvements Act of 1976
- 7) Hard-Scott-Rodino Act of 1980

**Industrial Regulation**

-not good

**Macroeconomics**

- the study of economy-wide aggregates and averages
- used for international policy and politics

**National Income**

- \***GDP**-total market value of all finished goods and services ; within the borders
- equals total income of the people or total expenditures on goods produced
- \***income approach**: NI= rents + interest + wages + profits (factors of production)
- then add indirect business taxes – subsidies + depreciation + net foreign factor income
- \***expenditure approach**:  $C + I + G + (X-M)$ ; exports – imports= aggregate expenditures
- \***GNP**-GDP +- net foreign factor income
- \***NDP, NNP**- GDP – capital consumption allowance(depreciation)
- \***NI**- NDP +- net foreign factor income –(indirect business taxes – subsidies)
- \***PI**- NI + transfer payments by the government to businesses and individuals – corporate retained earnings – corporate income taxes – social security contributions
- \***DI**- PI – personal income taxes

**Inflation Measurements**

- rate at which purchasing power is falling
- \***CPI**- price of basket 2007/ price of basket 82-84 \* 100
- \***WPI**- wholesale inflation; producer price index
- \***GDP deflator**- takes inflation out of GDP; measures to a base year

**Downward sloping AD curve**

- 1) real balance or real wealth effect
  - 2) interest rate effect
  - 3) international or foreign purchases effect
- \***aggregate supply**- flexible in long term and sticky in short term
  - \***economic growth**- the rate of change in the GDP

-real economic growth rate- measured per capita

**PPC PPF**- ideal consumption for economy; to the right is better; trade deficit extends PPC

-increase in productive resources, increase in supply of capital goods, technological improvements, international specialization and trade improve the PPC

-trade deficits increase out the PPC; trade surplus decreases the PPC

\***net investment**= gross investment – depreciation

### Business Cycles

1) Expansion

2) Peak

3) Recession

4) Trough

-leading, coincident, and lagging indicators

### Price of Money (exchange rates)

M1- narrow money; liquid

M2- broad money

M3- widest measure; least liquid

-assets demand and interest rates; transaction demand and level of income

\***liquidity preference theory**- demand for money and interest rate

### Monetary Policy

-controls spending, inflation, and the availability of credit

1) reserve requirement- very powerful

2) open market operations- primary mechanism; buying and selling gov. securities

3) discount rate- rate to borrow funds from the fed

-moral suasion, margin requirements, selective credit control

-benefits: speed and flexibility, isolation from political pressure

-limitations- lags in recognition and impact, velocity of money moving in different directions, cyclical asymmetry- good for tight policy and bad for easy policy

\***recognition lag**- why this doesn't work- can't correctly predict

\***money multiplier, deposit multiplier effect**-  $1/r$  \* excess reserves

### Unemployment

\***unemployment rate**- number of unemployed/ number of unemployed + employed (labour force)

\***misery index**- sum of inflation and unemployment rates

-frictional- job search

-structural- geography and skills

-cyclical (0% is full employment) and seasonal

\***natural rate**- where it gravitates to- 4% in US

### Inflation

\***cost-push inflation**- increase in production costs; decrease taxes and increase gov. spending

\***demand-pull inflation**- too much demand; increase taxes and decrease gov. spending

-inflation hurts creditors, savers, and fixed incomes

-costs of inflation

**\*inflation premium**- the difference between the real interest rate and the nominal interest rate

-nominal= real + inflation premium

-according to Phillips curve, as unemployment rises inflation falls

### **Fiscal Policy**

**\*demand-side fiscal policy**- usually acts to control the demand

-expansionary= increase spending and decrease tax rate

-contractionary= decrease spending and raise tax rate

**\*budget deficit**- cyclical and structural deficits

-cyclical= caused by downturns

-structural= normal deficit

**\*transfer payments**= negative tax; welfare and Medicare

**\*private goods**- only one can use

**\*public goods**- highways; spillover and externality, when other people prosper

**\*supply-side fiscal policy**- with lower marginal tax rates, people will work harder and supply more

-laffer curve is used, but is not very reliable

-debt financing and taxes are how the gov. raises money

-debt can crowd out big companies

-taxes are based on benefits received and ability to pay

-progressive, proportional, and regressive taxes

-direct and indirect taxes(sales tax)

-VAT taxes- consumers pay but firms collect

-lorenz curve dictates a 45 degree angle

**\*automatic stabilizers**- progressive income taxes, corporate taxes, and unemployment insurance

-discretionary vs. non-discretionary(automatic stabilizers)

**\*International Organization for Standardization (ISO)**- 9000, 14000; not mandatory



## Macroeconomic schools of thought

### **Classical Theory**

- no unemployment
- no government interference is good
- economy will fix itself; free markets and flexible prices

### **Keynesian Economics**

- strict monetary policy is bad; emphasized fiscal policy (government intervention)
- 3 principles- difference between savings and investments is key to understanding income; price flexibility can't guarantee full employment; equilibrium GDP will not necessarily provide full employment

$$\text{GDP} = C + I + X + G$$

$$\text{MPC} + \text{MPS} = 1$$

$$\text{GDP multiplier} = 1 / (1 - \text{MPC})$$

$$\text{Real GDP} = \text{nominal GDP} / \text{GDP deflator}$$

- inflationary (*aggregate spending higher than non-inflationary GDP*) vs. recessionary gaps (*non-inflationary GDP higher than aggregate spending*)

**Monetarism**- slow constant growth of money supply is key; less fiscal policy

**Supply-side economics**- reduce taxes, against government intervention and progressive taxes, free markets

## II.

### Trade Barriers

- tariffs, import quotas, exchange controls, export subsidies, countervailing duties, domestic content rules
- \***comparative advantage**- better opportunity cost
- \***absolute advantage**- better per unit cost
- \***current account**- short term exports, imports, interest, dividends, unilateral transfers
- \***capital account**- long term investments, financial and real
- added together gives the balance of payments; credit good debit bad
- set import quotas, encourage exports, substitute products, devalue currency, ship gold or reserve assets- to fix the balance of payments

### Exchange Rates

\***direct quote**- 1 unit of foreign = X units domestic

\***indirect quote**- 1 unit domestic = X units foreign

\***depreciation/appreciation**= 2-1/1

1) floating, flexible exchange rate-

\***purchasing power parity**- goods should cost the same everywhere(long term)

-medium term- affected by home economy

-short term- affected by interest rates

2) fixed exchange rate- set by some outside force, government

-gold standard for example

- government buys and sells currency to maintain the rate
- 3) managed float- both fixed and floating
- \***spot rate**- at that point in time
- \***forward rate**- in the future
- annual effect= (forward-spot/spot) \* # of forward periods in year

### Hedges

- after natural hedges:
- 1) **operational hedge**- maintain a balance between payables and receivables in foreign currencies; diversification
- 2) **international financing hedge**- borrowing
- 3) **currency market hedges**
- \***forwards contracts**- buy a forward for payables; sell a forward for receivables
- interest rates in the 2 countries balance out with discounts and premiums
- \***interest rate parity theorem**- forward exchange rate/ spot exchange rate = 1+ foreign nominal interest rate/ 1+ domestic nominal interest rate
- \***currency futures**- standardized and traded at organized exchanges; set amounts (trade unit); direct quote; settled every market day;
- \***currency options**- used to hedge against adverse risk only
- call option to buy or put option to sell; buyer pays premium

### Direct Foreign Investment

- foreign currency loans depend on: interest rate and change in borrowed's value
- \***effective financing rate**=  $r_f = (1 + i_f) * (1 + e_f) - 1$
- \***country risk**- political and financial risks in the foreign country
- lower the correlation coefficient between a country's projects, the lower the overall risk
- **variance formula**
- \***transfer pricing**- the exchange between MNC
- \***SDR**- issued by the World Bank
- GATT, IMF, WTO
- free trade area, custom union, economic union, economic and monetary union

### Payment Methods

- 1) prepayment by wire transfer or check
- 2) letter of credit- irrevocable- standby letter of credit
- 3) documentary collections and drafts- sight or time draft
- 4) open account
- 5) consignment

### Financing Methods

- 1) accounts receivable financing
- 2) cross-border financing
- 3) letters of credit
- 4) bankers' acceptances
- 5) working capital financing
- 6) forfaiting
- 7) countertrade

# Microeconomics

## I. Markets and Prices

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## IV. Information, Market Failure, and the Role of the Government

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Markets with Asymmetric Information

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# I. Markets and Prices

## Preliminaries

### 1. Themes of microeconomics

- microeconomics is the study of how firms and individuals make decisions and how these decision makers interact; use many of the same tools because macroeconomic events arise from microeconomic interactions
- central assumption is that individuals optimize for best utility
- for many microeconomic models, the microeconomic assumptions underlying the model are considered implicitly (givens), not explicitly
- concerned with decisions made by small economic units and the interaction of consumers and firms to form markets and industries

**1. positive analysis**- analysis describing relationships of cause and effect

**2. normative analysis**- analysis examining questions of what ought to be

### 2. What is a market

-a collection of buyers and sellers who interact, and to the possibility for sales and purchases that results from that interaction

\***perfectly competitive markets**- no single buyer or seller has an impact on price

-single price will usually prevail

\***noncompetitive markets**- individual entities can affect price

-different sellers may charge different prices; market price then refers to the average prevailing price

-market price is established by the interaction of buyers and sellers

\***market extent**- markets have geographical and product boundaries

### 3. Real v. nominal prices

\***real prices, constant dollar**- use an aggregate price index, such as CPI, to adjust for inflation

\***nominal prices, current dollar**- absolute price; unadjusted for inflation

\***CPI**- measure of the aggregate price level

## Basics of Supply and Demand

### 1. Supply and Demand

#### 1. supply curve

-relationship between the quantity of a good that producers are willing to sell and the price of the good; costs are important

-upward sloping- higher the price more suppliers are willing to produce

#### 2. demand curve

-relationship between the quantity of a good that consumers are willing to buy and the price of the good

-downward sloping- higher the price, less consumers are willing to buy

\***substitutes**- increase in 1 leads to increase of demand for the other

\***complements**- increase in 1 leads to decrease of demand for the other

### 2. Market Mechanism

-the tendency for supply and demand to equilibrate; price to move to the market clearing level, so that there is neither excess supply or demand

-both sellers should have little market power; the ability to influence the supply and demand

### 3. Changes in Market Equilibrium

#### Demand curve

1. disposable income (as economy contracts or grows)

2. seasonal

3. due to prices

4. changing tastes

#### Supply curve

1. wage rates

2. capital costs

3. prices of raw materials

### 4. Elasticities of Supply and Demand

-elasticities describe the responsiveness to changes in price, income, or other variables

-elasticities pertain to a time frame; short or long term

\***elasticity**- % change in 1 variable resulting from a 1 % change in another variable

\* **price elasticity of demand**- % change in quantity demanded resulting from a 1% change in price

-must be measured at a point along the demand curve

\***price elastic**- price elasticity is greater than 1

\***price inelastic**- price elasticity less than 1

\***linear demand curve**- demand curve that is straight

\***infinitely elastic demand**- consumers buy as much as they can for a single price, but for higher prices will buy 0; for lower prices will be infinite amount relative

**\*completely inelastic demand**- consumers buy a fixed quantity regardless of price

**\*income elasticity of demand**- % change in the quantity demanded resulting from a 1 % increase in income

**\*cross-price elasticity of demand**- % change in the quantity demanded of 1 good resulting from a 1 % increase in the price of another

**\*price elasticity of supply**- % change in quantity supplied resulting from a 1 % increase in price

### **5. Short-Run v. Long-Run Elasticities**

-demand is generally more elastic in the long run but is in the short run for consumer durables

-cyclical industries will differ

-supply is generally elastic in the long term as well; capacity constraints are present in the short time and upgrades take time

### **6. Understanding and Predicting the Effects of Changing Market Conditions**

-if we know conditions, we can forecast effectively

### **7. Effects of Government Intervention- Price Controls**

-price controls will significantly affect the supply and demand curves

# II. Producers, Consumers, and Competitive Markets

## Consumer Behaviour

### 1. Consumer Preferences

-consumer theory assumes rationally behaving people

-2 parts to consumer choice: consumer preferences; budget line constraints

#### 3 parts to consumer behaviour theory

1. consumer preferences

2. budget constraints

3. consumer choices

-choices are made by comparing market baskets or bundles of goods

#### Assumptions about preferences

##### 1. completeness

-will make a choice, even indifference

##### 2. transitivity

-A over B, B over C, then A over C

##### 3. more is better than less

-more is always preferred

##### 4. diminishing rate of marginal substitution

-indifference curves are convex

\***convex**- slope of the indifference curve increases (less negative) as we go down the curve; as more of a good is consumed, we will give up less of a second good to get more of the first good

\***indifference curve**- curve representing all combinations of market baskets that provide a consumer with the same level of satisfaction

-downward sloping and cannot intersect each other; willingness to substitute 1 good for another

\***indifference map**- graph containing a set of indifference curves showing the market baskets among which a consumer is indifferent

-provides an ordinal ranking of all choices that the consumer may make

\***marginal rate of substitution MRS**- amount of a good that a consumer is willing to give up in order to obtain 1 additional unit of another good

-MRS of F for C is the amount of C a person is willing to give up for 1 more unit of F; diminishes as we move down along an indifference curve; diminishing MRS means preferences are convex

$$\text{MRS} = P_f/P_c$$

$$\text{MRS} = MU_f/MU_c$$

$$P_f/P_c = MU_f/MU_c$$

**\*equal marginal principle**- principle that utility is maximized when the consumer has equalized the marginal utility per dollar of expenditure across all goods

**\*perfect substitutes**- 2 goods for which the MRS of 1 for another is constant

**\*perfect complements**- 2 goods for which the MRS is infinite; the indifference curves are shaped as right angles

**\*bad good**- good for which less is preferred rather than more

**\*utility**- numerical score representing the satisfaction that a consumer gets from a given market basket

**\*utility function**- formula that assigns a level of utility to individual market baskets

**\*ordinal utility function**- utility function that generates a ranking of market baskets in order of most to least preferred

**\*cardinal utility function**- utility function describing by how much 1 market basket is preferred to another

## 2. Budget Constraints

**\*budget constraints**- constraints that consumers face as a result of limited incomes

**\*budget lines**- represent all combinations of goods for which consumers expend all their income

-shift outward in response to an increase in consumer income; when the price of 1 good (horizontal axis) changes while income and the price of the other good do not, budget lines pivot and rotate about a fixed point on the vertical axis

### 2 Changes

#### 1. income

-alters vertical intercept, not slope; shifts outward or inward

#### 2. price

-alters slope, not vertical intercept; shifts outward or inward

-purchasing power is affected by income and price

-if they both change by the same slope remains constant and intercepts change

## 3. Consumer Choice

-consumers maximize satisfaction to budget constraints; when a consumer maximizes some of each of 2 goods, the MRS is equal to the ratio of the prices of the 2 goods being purchased

### 2 Conditions for Maximizing Market Baskets

1. it must be located on the budget line

2. it must give the consumer the most preferred combination of goods and services

-satisfaction is maximized when the MRS (of F for C) is equal to the ratio of prices of (F to C)



- when MRS is less than or greater than the price ratio, consumer's satisfaction is not being maximized; consuming too much of either good
- can also hold true for baskets of multiple goods
- \***marginal benefit**- benefit from the consumption of 1 additional unit of a good
- \***marginal cost**- cost of 1 additional unit of a good
- maximization is sometimes achieved at a corner solution where 1 good is not consumed; in this case, the MRS need not equal the ratio of the prices
- when a consumer doesn't want 1 of the goods

#### 4. Revealed Preference

- theory of revealed preference shows how the choices that individuals make when income and price vary can be used to determine their preferences; when an individual prefers basket A to B, even though they can afford B, they naturally prefer A
- we can determine preferences by examining which goods they bought

#### 5. Marginal utility and consumer choice

##### 2 Approaches to Theory of the Consumer

1. indifference curve
  - uses the ordinal properties of utility; allows for ranking of alternatives
2. utility function
  - uses the cardinal properties of utility; obtains a utility function by attaching a number to each basket
  - \***marginal utility**- additional satisfaction obtained from consuming 1 additional unit of a good
  - \***diminishing marginal utility**- principle that as more of a good is consumed, the consumption of additional amounts will yield smaller additions to utility
  - when risky choices are analyzed, or when comparisons must be made among individuals, the cardinal properties of the utility function are important; utility function usually show diminishing marginal utility
  - when the utility function approach is used and both goods are consumed, utility maximization occurs when the ratio of the marginal utilities of the 2 goods (MRS) is equal to the ratio of the prices

#### 6. Cost-of-living indexes

- \***cost of living index**- ratio of the present cost of a typical bundle of consumer goods and services compared with the cost during a base period
- \***ideal cost of living index**- measures the cost of buying, at current prices (2000), a bundle of goods that generates the same level of utility as was provided by the bundle of goods at base-year prices (1999)

##### 2 Types

###### 1. fixed weighted

- cost-of-living index in which the quantities of goods and services remain unchanged
- \***Laspeyres price index**- amount of money at current-year prices that an individual requires to purchase a bundle of goods and services chosen in a base year divided by the cost of purchasing the same bundle at base-year prices
- CPI is an example; overstates the ideal cost-of-living index

**\*Paasche index**- amount of money at current-year prices that an individual requires to purchase a current bundle of goods and services divided by the cost of purchasing the same bundle in a base year; understates the ideal-cost of living index

**2. chain weighted**

-cost-of-living index that accounts for changes in quantities of goods and services

-used to chain-weight GDP

-can account for changes in computer buying patterns and prices drop

-developed from dissatisfaction from the Laspeyres index

## Individual and Market Demand

### 6 Steps to Analyze Demand

1. Individual Demand
2. Income and Substitution Effects
3. Market Demand
4. Consumer Surplus
5. Network Externalities
6. Empirical Estimation of Demand

### 1. Individual Demand

-price changes and income changes are the primary factors of individual demand

**\*individual demand curve**- curve relating the quantity of a good that a single consumer will buy to its price

### 2 Properties of Individual Demand Curve

1. the level of utility that can be attained changes as we move along the curve
2. at every point on the demand curve, the consumer is maximizing utility by satisfying the condition that the MRS of food for clothing equals the ratio of the prices of food and clothing

**\*price-consumption curve**- curve tracing the utility-maximizing combinations of 2 goods as the price of 1 changes

-changes in price lead to a movement along a demand curve

**\*income-consumption curve**- curve tracing the utility-maximizing combinations of 2 goods as a consumer's income changes

-changes in income lead to a shift in the demand curve

**\*normal good**- greater the shifts to the right of the demand curve, the larger the income elasticity; consumers want more as their income increases

**\*inferior good**- income elasticity of demand is negative; consumption falls when income rises

**\*Engel curve**- curve relating the quantity of a good consumed to income; can be useful for understanding how consumer expenditures vary with income

**\*substitutes**- an increase in price of 1 leads to an increase in the quantity demanded of the other

**\*complements**- an increase in the price of 1 leads to a decrease in the quantity demanded of the other

**\*independent**- changes in price have no effects

-to determine the effects on other goods, we must look at all markets they are involved in

### 2. Income and Substitution Effects

-these 2 effects normally happen simultaneously

#### 2 Effects of Price Drops

**1. substitution effect**- consumers will tend to buy more of the good that has become cheaper and less of those goods that are now relatively more expensive

-satisfaction (utility) remains constant while price changes

**2. income effect-** because 1 of the goods is now cheaper, consumers enjoy an increase in real purchasing power

-price remains constant while satisfaction (utility) changes

-can be positive or negative; a price change can have a small or large effect on quantity demanded

**\*Giffen good-** good whose demand curve slopes upward because the (positive) income effect is larger than the (negative) substitution effect

-quantity demanded moves in the same direction as the price change

-rarely of practical interest because it requires a large negative income effect; drop in price of food frees up money for purchase of more clothes

-large income effects are often associated with normal rather than inferior goods

### 3. Market Demand

-considers all consumers in the market opposed to 1 individual

**\*market demand curve-** curve relating the quantity of a good that all consumers in a market will buy to its price

-can be used to calculate how much people value the consumption of particular goods and services

#### 2 Major Points

1. the market demand curve will shift to the right as more consumers enter the market

2. factors that influence the demands of many consumers will also affect market demand

#### *Elasticity of Demand*

**1. inelastic demand-** 1% increase in price leads to a less than 1% increase in quantity demanded; increases the consumer's expenditure

**2. elastic demand-** 1% increase in price leads to a more than 1% increase in quantity demanded; decreases the consumer's expenditure

**3. isoelastic demand-** demand curve with a constant price elasticity; unit elastic; linear demand curve

**4. point elasticity of demand-** price elasticity at a particular point on the demand curve; magnitude of the slope of the demand curve at that point:  $P/Q$

**5. arc elasticity of demand-** price elasticity calculated over a range of prices; average -arc can be useful, but generally elasticity refers to point elasticity

### 4. Consumer Surplus

-measures how much better off consumers are in the aggregate because they can buy goods in the marketplace

**\*consumer surplus-** difference between what a consumer is willing to pay for a good and the amount actually paid

-benefits people receive from the consumption of a product; can be measured in aggregate terms for an economy or for the individual

### 5. Network Externalities

**\*network externalities-** when each individual's demand depends on the purchases of other individuals

**\*bandwagon effect**- positive network externality in which a consumer wishes to possess a good in part because others do; stylish

-can also be greater intrinsic value from owning, like: DVDs and computers

**\*snob effect**- negative externality in which a consumer wishes to own an exclusive or unique good

-worth more the fewer people that own it; less elastic demand, making it easier to raise prices; Rolex watches

-can also arise from not wanting to stand in line; pay more for tickets at smaller places

## 6. Empirical Estimation of Demand

-demand is not always linear; the log-linear isoelastic demand curve is therefore the most useful form to use for regression analysis

### 3 Methods

1. interview and experimental approaches
2. direct marketing
3. statistical analysis

### Method of Lagrange Multipliers

-technique to maximize or minimize a function subject to 1 or more constraints

**\*Lagrangian**- function to be maximized or minimized, plus a variable (Lagrangian multiplier) multiplied by the constraint

1. state the problem
2. differentiate the Lagrangian
3. solve the resulting equations

-equal marginal principle, MRS, and MU of income can be solved from this method

**\*Cobb-Douglas utility function**- allows us to solve for prices and quantities of 2 goods demanded

**\*duality**- alternative way of looking at the consumer's utility maximization decision: rather than choosing the highest indifference curve, given a budget constraint, the consumer chooses the lowest budget line that touches a given indifference curve

**\*Slutsky equation**- formula for decomposing the effects of a price change into substitution and income effects

**\*Hicksian substitution effect**- alternative to the Slutsky equation for decomposing price changes without recourse to indifference curves

## Choice Under Uncertainty

### 1. Describing Risk

- probability, expected value, payoffs, deviation, variability, standard deviation
- risk applies when each of the possible outcomes and its probability is known

### 2. Preferences Toward Risk

- facing uncertain choices, consumers will maximize their expected utility- an average of the utility associated with each outcome- with the associated probabilities serving as weights
- risk averse, risk neutral, risk loving, expected utility
- risk premium is the maximum amount of money a risk-averse person will pay to avoid taking risk
- the extent of an individual's risk aversion depends on the nature of the risk and on the person's income
- income and risk indifference curves are always upward sloping, because risk is undesirable and more income is required to compensate for the risk

### 3. Reducing Risk

#### *3 Ways to Reduce Risk*

1. diversification- negatively v. positively correlated
2. insurance- law of large numbers and actuarial fairness
3. additional information

### 4. Demand for Risky Assets

- assets, return, riskless asset, real (simple) return, expected v. actual returns
- tradeoff between risk and return; must attain the desired investment portfolio
- \***price of risk**- extra risk that an investor must incur to enjoy a higher expected return
- consumer theory can be applied to decisions to invest in risky assets; the budget line reflects the price of risk, and the consumers' indifference curves reflect their attitudes toward risk

## Production

- theory of the firm; not individual supply and demand
- studies a firm's production technology: use of inputs and scale of operations

### 1. Technology of Production

- the theory of the firm explains how a firm makes cost-minimizing production decisions and how its cost varies with its output

\***factors of production**- inputs into the production process; labour, capital, materials

\***production function**- shows the highest output a firm can produce for every specified combination of inputs

$$Q=F(K,L)$$

- describe what is technically feasible when the firm operates efficiently for a given technology

### 2. Isoquants

- isoquants show flexibility firms have when making production decisions

\***isoquant**- curve showing all possible combinations of inputs that yield the same output

\***isoquant map**- combines several isoquants to describe a production function

\***short run**- period of time in which quantities of 1 or more production factors cannot be changed

\***fixed input**- production factor that cannot be varied

\***long run**- amount of time needed to make all production inputs variable

- the short and long run must be considered in conjunction with an isoquant

### 3. Production with 1 Variable Input (labour)

- can examine in 2 ways: incremental (marginal) or average

\***average product of labour**- output per unit of a particular input;  $Q/L$

\***marginal product of labour**- additional output produced as an input is increased by 1 unit

- the average and marginal product of labour curves are closely related; when the marginal product is less than the average product, the average product is decreasing; when the marginal product is greater than the average product, the average product is increasing

-the marginal product equals the average product when the average product reaches its maximum

-the average product of labour is given by the slope of the line drawn from the origin to the corresponding point on the total product curve; the marginal product of labour is given by the slope of the total product at that point

\***law of diminishing marginal returns**- principle that as the use of an input increases with other inputs fixed, the resulting additions to output will eventually decrease

- usually applies in the short run when at least 1 input is fixed, but can apply in the long run

-does not apply to improvements in quality of labour or technology improvements

-is not a negative relationship, just a declining one

\***labour productivity**- average product of labour for an entire industry or for the economy as a whole

\***stock of capital**-total amount of capital available for use in production

\***technological change**- development of new technologies allowing factors of production to be used for efficiently

-the standard of living a country can attain is closely related to its level of labour productivity; decreases in the rate of productivity growth in developed countries are due in part to the lack of capital growth investment

#### 4. Production with 2 Variable Inputs

-long run production where both inputs are variable

-isoquants always slope downwards because the marginal product of all inputs is positive; the shape of each isoquant can be described by the marginal rate of technical substitution at each point on the isoquant

\***marginal rate of technical substitution MRTS**- amount by which the quantity of one input can be reduced when 1 extra unit of another input is used, so that output remains constant

-will be diminishing MRTS with a convex shape

-there will be diminishing marginal returns to labour and capital

-the possibilities for substitution among inputs in the production process range from a production function in which inputs are perfect substitutes to one in which the proportions of inputs to be used are fixed

\***fixed proportions production function**- production function with L-shaped isoquants, so that only one combination of labour and capital can be used to produce each level of output

#### 5. Returns to Scale

-in long-run analysis we will focus on the firm's choice of its scale or size of operations

\***returns to scale**- rate at which output increases as inputs are increased proportionately

-can be increasing, decreasing, or constant



## The Cost of Production

### 1. Measuring Cost: Which Costs Matter?

\***accounting costs**- actual expenses plus depreciation charges for capital equipment

\***economic costs**- cost of a firm utilizing economic resources in production, including opportunity cost

-opportunity and sunk costs must be considered; sunk cost opportunity value is 0

-a prospective sunk cost would be an investment

-fixed costs can be avoided by going out of business, sunk costs cannot

### 2. Cost in the Short Run

-in the short run not all costs are variable

-marginal cost, average variable cost, average total cost, average fixed cost

-variable and total costs increase with output; type of increase depends on the nature of the production and process and the degree of diminishing returns in the variable factors

-diminishing marginal returns means marginal cost increases with output

-when not all inputs are variable, the presence of diminishing returns determines the shape of the costs curves; there is an inverse relationship between the marginal product of a single variable input and the marginal cost of production

-the average variable cost and average total cost curves are U-shaped; the short-run marginal cost curve increases beyond a certain point, and cuts both average cost curves from below their minimum points

-the total cost curve is formed by adding the fixed cost curve to the variable cost curve

### 3. Cost in the Long Run

-in the long run all inputs are variable; as a result, the choice of inputs depends both on the relative costs of the factors of production and on the extent to which the firm can substitute among inputs in its production process; the cost minimising input choice is made by finding the point of tangency between the isoquant representing the level of desired output and an isocost line

\***user cost of capital**- sum of the annual cost of owning and using a capital asset, equal to economic depreciation plus forgone interest

\***rental rate**- cost per year of renting 1 unit of capital

-rental rate should equal the user cost; user cost is owned and rental rate is leased; should be considered together

-capital that is purchased can be treated as though it were rented at a rental rate equal to the user cost of capital

\***isocost line**- graph showing all possible combinations of labour and capital that can be purchased for a given total cost; slope is the wage rate/ rental cost of capital

-when expenditure on inputs increases, slope of the isocost line does not change, just the intercept; if the price of an input increases, the slope of the isocost line changes

-the isocost line also relates to the firm's MRTS (production process); derivation

**\*expansion path-** curve passing through points of tangency between a firm's isocost lines and its isoquants; shows cost-minimizing combinations of labour and capital at each output level

-shows how its cost-minimizing input choices vary as the scale or output of its operation increases; as a result, the expansion path provides useful information relevant for long-run planning decisions

#### 4. Long-Run v. Short-Run Cost Curves

-long-run LAC and short-run average SAC cost curves are both U-shaped, but for different reasons; short-run has inflexibility issues because of fixed costs (diminishing returns) ,and long-run has increasing and decreasing returns to scale

-LMC long run marginal cost curve lies below the LAC when LAC is falling and above LAC when LAC is rising

-the long-run average cost curve is the envelope of the firm's short-run average cost curves, and it reflects the presence or absence of returns to scale

-when they are constant returns to scale and many plant sizes are possible, the long-run average cost curve is horizontal; the envelope consists of the points of minimum short-run average cost

-when there are increasing returns to scale initially and then decreasing returns to scale, the long-run average cost curve is U-shaped, and the envelope does not include all points of minimum short-run average cost

-LAC always lies below the SAC curve; even though the LAC envelopes the SAC, the LMC does not envelope the SMC

-a firm enjoys economies of scale when it can double its output at less than twice the cost; correspondingly, there are diseconomies of scale when a doubling of output requires more than twice the cost

-scale economies and diseconomies apply even when input proportions are variable; returns to scale applies only when proportions are fixed

#### 5. Production with 2 Outputs- Economies of Scope

**\*economies of scope-** is when the firm produces with 2 or more outputs

-arise when the firm can produce any combination of the 2 outputs more cheaply than could 2 independent firms that each produced a single product; the degree of economies of scope is measured by the % reduction in cost when 1 firm produces 2 products relative to the cost of producing them individually

**\*diseconomies of scope-** occurs when the firm is less productive producing 2 products

**\*product transformation curve-** curve showing various combinations of 2 different outputs (products) that can be produced with a given set of inputs

-the degree of economies of scope is a % representing the cost savings

#### 6. Dynamic Changes in Costs- Learning Curves

-a firm's average cost of production can fall over time if the firm learns how to produce more efficiently; the learning curve shows how much the input needed to produce a given output falls as the cumulative output of the firm increases

##### 4 Reasons Costs Fall

1. speed increases with adeptness

2. managers schedule better
  3. engineers design better products; technology
  4. suppliers become more efficient
- learning curve can work with economies of scale
  - learning curve is important is deciding whether or not to go into business

### **7. Estimating and Predicting Costs**

**\*cost functions**- relate the cost of production to the firm's level of output; the functions can be measured in both the short run and the long run by using either data for firms in an industry at a given time or over time

-linear, quadratic, and cubic functions can be used

## Profit Maximization

### 1. Perfectly Competitive Markets

-managers act according to constraints; but we can assume that firms act as if they are maximising long-term profits

#### 3 Assumptions of Perfectly Competitive Market

1. price taking

2. product homogeneity- substitutable products

3. free entry and exit- no special costs

-when these assumptions hold, supply and demand curves can be used for analysis

-most markets are not perfectly competitive, but are highly competitive; easy entry and exit and highly elastic demand curves

-many markets may approximate perfect competition in that 1 or more firms act as if they face a nearly horizontal demand curve; in general, the number of firms in an industry is not always a good indicator of the extent to which that industry is competitive; many can collude and a few can still be competitive

-because a firm in a competitive market has a small share of total industry output, it makes its output choice under the assumption that its production decision will have no effect on the price of the product; in this case, the demand curve and the marginal revenue curves are identical

### 2. Profit Maximization

-a competitive firm and the market have separate demand curves

-in the short-run, a competitive firm maximizes its profit by choosing an output at which price is equal to (short-run) marginal cost; price must, however, be greater than or equal to the firm's minimum average variable cost of production

-profit maximization usually only occurs in small businesses; large businesses have managers that focus on: revenue maximization, revenue growth, or dividends to satisfy owners; but they can be removed for these things

### 3. Marginal Revenue, Marginal Cost, and Profit Maximization

**\*profit**- difference between total revenue and total cost

**\*marginal revenue**- change in revenue resulting from a 1-unit increase in output

-total cost is positive at 0 output because of fixed costs

-cost curves, output curves, and profit curves must be analyzed

$MR=MC$ ; profit maximizing scenario for any firm, competitive or not

-will increase output to increase revenues and profits until marginal costs preclude additional profits

-the competitive firm is a price taker; their small total share can't influence the industry demand and supply curves; thus, production decisions do not consider market prices, they are a given

- because they are a price taker, the demand curve for a individual competitive firm will be denoted by a horizontal line
- horizontal axis is output, and vertical axis is price
- market demand curve is downward sloping however, because customers will buy more at a lower price
- for the individual firm, the average revenue curve and marginal revenue curve are the same and represent the demand curve; along this demand curve marginal revenue, average revenue, and profit will all be equal;  $MR=P=AR= MC$
- competitive firms set output, not prices

#### **4. Choosing Output in the Short Run**

- must determine variable inputs; MC, AC, ATC
- if the firm is producing any output at all, it should produce at the level at which  $MR=MC$ ;  $MR=MC$  at the point where the MC curve is rising
- a firm does not have to earn a profit in the short run
- a firm losing money has 2 options in the short run: shut down temporarily, keep producing
- when there are no sunk costs (fixed and variable are ok), the firm's average total cost is equal to its average economic cost; thus, the firm should shut down when the price of its product is less than the average total cost at the profit-maximizing output
- if the price of the product is greater than the economic cost of production, the firm makes a positive economic profit by producing; it will choose to produce; regardless of sunk costs, though their presence reduces economic profit (shut-down rule)

#### **5. The Competitive Firm's Short-Run Supply Curve**

- supply curves show how much output the firm will produce at different prices
- competitive firms will increase to where  $P=MC$  but will shut down when P is below average economic cost
- average economic cost is equal to ATC when there are no sunk costs, but equal to AVC when fixed costs are actually amortized sunk costs; therefore, the firm's supply curve is the portion of the MC curve that lies above the average economic cost curve
- short-run supply curves for competitive firms slope upwards for the same reason MC increase (diminishing returns); but as P increases, so does total profit when increasing production; though average profit per unit will decrease
- when P changes, the firm changes its output level to ensure  $MC=P$ ; when inputs change this will in turn affect the P

#### **6. Short-Run Market Supply Curve**

- the short-run market supply curve is the horizontal summation of the supply curves of the firms in an industry; because all firms change output as prices rise, it can best be characterized by the elasticity of supply: the % change in quantity supplied in response to a % change in price
- because MC curves are always upward sloping, the short-run elasticity of supply is always positive; when MC increase rapidly, elasticity is low; when MC increase slowly, elasticity is high

**\*perfectly inelastic supply**- when the industry's plant and equipment are so fully utilized new plants are needed for additional output (long-run)

**\*perfectly elastic supply**- when MC are constant; no new infrastructure is needed (short-run)

**\*producer surplus**- for a firm is the difference between its revenue and the minimum cost that would be necessary to produce the profit-maximizing output;  $= R - VC$

-equals revenue minus variable costs (variable profit)

-similar to profit (profit includes fixed costs); in the short-run, when fixed costs are positive, producer surplus is greater than P

-in both short-run and long run, producer surplus is the area under the horizontal price line and above the marginal cost of production

-just like consumer surplus

-can also be characterized as: difference between the firm's revenue and its total variable cost

-higher cost firms have lower producer surplus

## 7. Choosing Output in the Long-Run

-can alter all inputs in long run; enter, exit

-long-run demand curve is horizontal as well; it must consider economies of scale to ensure  $MC=MR$ ; it must produce more cheaper to sustain profits in the long-run

-must choose point where  $P = LMC$

-in the long run, profit-maximizing competitive firms choose the output at which price is equal to long-run marginal cost

-economic profit includes opportunity costs in addition to accounting costs

-a firm earning 0 economic profit is making as good use of its money as it could elsewhere; a firm earning negative economic profit should consider leaving the market

### 3 Conditions for Long-Run Competitive Equilibrium

1. when firms maximize profit

2. when all firms earn 0 economic profits; no incentive to enter or exit industry

3. when the quantity of the product demanded is equal to the quantity supplied

-when firms have different cost (patents), that firm can earn a greater accounting profit and enjoy a higher producer surplus; as long as the patent holds, no other firm has incentive to enter the industry; thus, for equilibrium, costs must be identical

-opportunity cost of land can lead to 0 economic profit; higher accounting profit for under-valued land, depending on the location and use

**\*economic rent**- the payment for a scarce factor of production less the minimum amount necessary to hire that factor; positive accounting profits; discourages new entrants

-economic rent explains why some industries don't allow firms to enter even when profit opportunities exist; must be located on a river, special person who is skilled

-0 economic profit tells a firm that it should remain in a market only if it is at least as efficient in production as other firms; it also tells possible entrants to the market that entry will be profitable only if they can produce more efficiently than firms already in the market

in the long run in a competitive market, producer surplus is equal to the economic rent generated by all scarce factors of production

## 8. Industry's Long-Run Supply Curve

-the long-run supply curve for a firm is horizontal when the industry is a constant-cost industry in which the increased demand for inputs to production (associated with an increased demand for the product) has no effect on the market price of the inputs; but, the long-run supply curve for a firm is upward sloping in an increasing-cost industry, where the increased demand for inputs causes the market price of some or all inputs to rise

### 3 Industries

1. constant-cost- industry whose long run supply curve is horizontal; unskilled labour industries
2. increasing-cost- industry whose long-run supply curve is upward sloping; mineral resources or skilled labour
3. decreasing-cost- industry whose long run supply curve is downward sloping; most industries, technology and such make producing cheaper

-a tax on 1 of a firm's inputs (effluent fee) creates an incentive for the firm to change the way it uses its inputs

-when taxes are on outputs, (pollution), must try to reduce output; could encourage some firms to exit; thus, taxes raise the LAC curve for each firm

-in constant-cost industry, the long-run elasticity of supply is infinitely large; in increasing-cost industry, the long-run supply elasticity is positive but finite

-long-run elasticities are generally larger than short-run

-elasticity is:  $Q/P$

## The Analysis of Competitive Markets

### 1. Gains and Losses from Government Policies: CS and PS

#### *Equilibrium in Market*

1. perfect competition- P equating supply with demand
2. monopoly-  $MR=MC$
3. monopolistic competition- long-run equilibrium results from entry of new firms to drive economic profits to 0
4. oligopoly- do their best based on competitors
  - government-imposed price ceiling causes quantity of a good demanded to rise, and quantity supplied to fall; shortage, excess demand
  - some consumers are better off, but what about the consumers as a whole; CS and PS helps to quantify these gains and losses
  - \***consumer surplus**- total benefit consumers receive beyond what they pay; how much more they would pay
  - \***producer surplus**- difference between market price producer receives and MC of producing the unit
  - simple models of supply and demand can be used to analyze a wide variety of government policies; specific policies examined include: price controls, minimum prices, price support programs, production quotas or incentive programs to limit output, import tariffs and quotas, and taxes and subsidies
  - in each case consumer and producer surplus are used to evaluate the gains and losses to consumers and producers; applying the methodology to natural gas price controls, airline regulation, price supports for wheat, and the sugar quota, we found that these gains and losses can be quite large
  - \***welfare effects**- gains and losses caused by the government intervention in the market
  - governmental intervention generally leads to a deadweight loss; even if consumer surplus and producer surplus are weighted equally, there will be a net loss from government policies that shifts surplus from 1 group to the other
  - in some cases, this deadweight loss will be small, but other times (such as with price supports and import quotas) it is large; this deadweight loss is a form of economic inefficiency that must be taken into account when policies are designed and implemented
  - depends many times on whether politicians value consumer or producer surplus more

### 2. Efficiency of a Competitive Market

- \***economic efficiency**- maximisation of aggregate consumer and producer surplus
- ineffective policies can create efficiency costs
- \***market failure**- situation in which an unregulated competitive market is inefficient because prices fail to provide proper signals to consumers and producers: externalities and lack of information
- \***externality**- actions taken by either consumers or producers which affects other producers or consumers but is not accounted for by the market price (pollution)



- government intervention in a competitive market is not always bad; government and the society may have objectives other than economic efficiency
- there are also situations where government intervention can improve economic efficiency: externalities and cases of lack of information

### 3. Minimum Prices

- raising prices above market clearing levels
- minimum wage laws, agricultural policies, airlines
- consumers are worse off; producers make more from each sale, but sell less
- producers can even be worse off due to much fewer sales

### 4. Price Supports and Production Quotas

- \***price support**- price set by government above free-market level and maintained by governmental purchases of excess supply
- are effected through loans, whereby if the price of grain is not high enough, they can forfeit the grain to the government for full payment of the loan; loan rate is a price floor
- agricultural products primarily
- consumers lose, producers win (sell just as much at higher prices), and the government loses (taxes, so consumers really lose)
- government can offset losses by dumping to foreign markets, but this hurts the producer's ability to sell to those markets
- welfare loss can be huge; more efficient to just give farmers money; but price supports are a more politically attractive method
- \***production quota**- simple decree by the government limiting supply; causes the price of the good to rise
- taxicabs, liquor
- deadweight loss, but not as bad as price supports
- in US agricultural policy, output is reduced by incentives rather than by quotas
- acreage limitation programs give farmers financial incentive not too farm
- consumers lose and producers gain the same from price supports and production quotas, but the government loses less with production quotas

### 5. Import Quotas and Tariffs

- keep the domestic price higher than world levels and allow domestic industry to enjoy higher profits than from free trade
- without quotas or tariffs, a country will import a good when its world price is below the market price that would prevail if there were no imports
- reduce consumer surplus and raise producer surplus
- \***import quota**- limit on the quantity of a good that can be imported
- \***tariff**- tax on an imported good
- sufficiently large tariffs will allow 0 imports, just as an import quota of 0, and will have the same effect on consumers and producers, and no revenue for the government from tariff collections
- however, government policies are usually intended to reduce, not eliminate imports

-tariffs are better for the home government, because the government collects revenue; voluntary import quotas just raise the prices of the goods that do make it in, raising profits for the foreign producer

### **6. Impact of a Tax or Subsidy**

-when a government imposes a tax or subsidy, price usually does not rise or fall by the full amount of the tax or subsidy; also, the incidence of a tax or subsidy is usually split between producers and consumers; the fraction that each group ends up paying or receiving depends on the relative elasticities of supply and demand

-a \$1 tax increase will raise the price by less than 1 dollar

\***specific tax**- tax of a certain amount of money per unit sold; gas and cigarette taxes

\***proportional tax** – ad valorem; sales taxes

-a tax of X cents means the price the buyer pays must exceed the net price the seller receives by X cents

-buyer and seller receive half of the burden each

### **4 Conditions Must be Satisfied Once Tax is in Place**

1. quantity sold and buyer's price must lie on the demand curve
2. quantity sold and seller's price must lie on the supply curve
3. quantity demanded must equal the quantity supplied
4. difference between the price the buyer pays and the price the seller receives must equal the tax

-taxes do also result in deadweight loss

-if demand is relatively inelastic and supply is relatively elastic, the burden of tax will fall mainly on buyers (cigarettes)

-if demand is relatively elastic and supply is relatively inelastic, the burden of tax will fall on the sellers

-in general, tax burden falls mainly on the buyer if elasticity ( $E_d/E_s$ ) is small, and on seller if elasticity is large ( $E_d/E_s$ )

\***pass through fraction**-  $E_s/(E_s - E_d)$ ; tells what fraction of tax is passed on to consumers

-when demand is totally inelastic, all the burden is borne by the buyers; when demand is totally elastic, all the burden is borne by the sellers

\***subsidy**- payment reducing the buyer's price below the seller's price; negative tax

-opposite effect of a tax; the quantity will increase

-benefit of a subsidy accrues mainly to buyers if ( $E_d/E_s$ ) is small and mostly to sellers if ( $E_d/E_s$ ) is large

-same 4 conditions apply as for a tax, but here the difference between sellers' price and buyers' price is equal to the subsidy, not the tax

## III. Market Structure and Competitive Strategy

### Market Power: Monopoly and Monopsony

#### 1. Monopoly

-market power is the ability of sellers or buyers to affect the price of a good

#### 2 Kinds of Market Power

**1. monopoly**- sellers charging prices above MC; amount P exceeds MC; 1 seller many buyers

**2. monopsony**- buyers can obtain below marginal value of the good; MV exceeds P; many sellers and 1 buyer

-monopoly and monopsony are the polar opposites of perfect competition

-the monopolist is the market and completely controls what is available for sale; can't charge whatever price it wants, must analyze the market demand curve

-monopolist's  $AR = P$ , is precisely the market demand curve; must determine its MR; when the demand curve is downward sloping,  $P(AR)$ , is greater than MR because all units are sold at the same price

-still  $MR=MC$  for profit maximizing output; same rules as for perfect competition

**\*rule of thumb** –  $P=MC/(1 + (1/Ed))$ - derived from MC, MR, and elasticity of demand equation that specifies quantity and price outputs; holds for any firm with monopoly power;  $Ed$  is the elasticity of demand for the firm, not the market

-it is harder to estimate elasticity of demand for the firm, because the firm must consider how its competitors will react to price changes; estimate % change in sales from a 1% change in price; use models or intuition

-if the firm's elasticity of demand is large, markup will be small; if elasticity of demand is small, markup will be large

-as the markup equation shows (rule of thumb), if demand is extremely elastic,  $Ed$  is a large negative number, and price will be very close to MC; in that case, a monopolized market will look much like a competitive one; in fact, when demand is very elastic, there is little benefit to being a monopolist

-in a competitive market there is a clear relationship between price and quantity supplied; it is the supply curve; a monopolist has no supply curve

- this is because a monopolist's decision depends on MC and the demand curve; shifts in demand do not correspond to a competitive supply curve; and so, shifts in demand can lead to changes in just price, just quantity, or both
- monopolist may supply several different quantities at the same price
- taxes affect monopolist's differently as well; in competitive markets, the burden is usually split between the consumer and producer; in monopoly, the total price can often rise by more than the amount of the tax
- this shifts the MC curve upwards (firm has to remit more money; higher cost), resulting in lower quantity and higher price
- P can increase by more than the tax because for the monopoly the relationship between cost and demand depends on the elasticity of demand; impossible in a competitive market
- if you have multiple plants just make sure  $MR=MC$  in each plant at an equal basis

## 2. Monopoly Power

- pure monopoly is rare; but each firm in a market with several firms will face a downward sloping demand curve, so they produce so that P exceeds MC
- monopoly power is determined in part by the number of firms competing in the market
- 1 firm's demand curve will depend both on how much its product differs from its competitors' products and on how the 4 firms compete with each other; each firm will face a demand curve more elastic than the demand curve, but that is not infinitely elastic like the demand curve facing a perfectly competitive firm
- for the competitive firm,  $P=MC$ ; for monopolistic firm, P exceeds MC
- \***Lerner index of monopoly power**- measure of monopoly power calculated as excess of price over MC as a fraction of price; %, P over MC; also =  $-1/E_d$
- monopoly power does not mean high profits; profit depends on AC

## 3. Sources of Monopoly Power

- monopoly power is inversely related to firm's elasticity of demand; lower the elasticity, greater the power to markup prices

### 3 Factors Determine Firm's Elasticity of Demand

#### 1. Elasticity of Market Demand

- if there is only 1 firm- pure monopoly- monopoly power depends entirely on the elasticity of market demand; the less elastic the demand, the more monopoly power the firm will have; depends on the products and market conditions

#### 2. Number of Firms in the Market

- more firms there are, harder for any 1 firm to affect price significantly
- must create barriers to entry; natural or made up: economies of scale, patents, license

#### 3. Interaction Among Firms

- more aggressive the rivalry the higher the elasticity of demand
- when there are several firms, monopoly power also depends on how the firms interact; the more aggressively they compete, the less monopoly power each firm will have
- monopoly power can change over time quickly as well; must be considered in a dynamic context

#### 4. Social Costs of Monopoly Power

- market power can impose costs on society; because monopoly and monopsony power both cause production to fall below the competitive level, there is a deadweight loss of consumer and producer surplus; there can be additional social costs from rent seeking
- consumers lose surplus and producers gain surplus; net deadweight loss however
- \*rent seeking**- spending money in socially unproductive efforts to acquire, maintain, or exercise monopoly power; lobbying, bad investments
- the social costs of monopoly often exceed the deadweight loss
- because of its social cost, the government prevents firms from acquiring too much monopoly power through antitrust laws and price regulation
- price regulation always results in deadweight loss in competitive markets, but not always in a monopoly; price regulation can actually eliminate deadweight loss from monopoly power
- this price ceiling causes the price to drop and quantity to increase
- \*natural monopoly**- firm that can produce the entire output of the market at a cost lower than what would be if there were several firm; economies of scale
- natural monopolies such as utility companies most often face price regulation
- sets P where  $AC=AR$
- competitive price is where MC and AR (demand) intersect; natural monopoly price is where AC and AR (demand) intersect
- \*rate-of-return regulation**- the maximum price allowed by a regulatory agency is based on expected rate of return that a firm will earn; used for monopolies
- very subjective process; results in a regulatory lag of change; most benefit goes to lawyers, accountants, and economists
- many of these traditional industries have been deregulated

#### 5. Monopsony

- monopsony is a market with only 1 buyer
- \*oligopsony**- market with only a few buyers
- \*monopsony power**- buyer's ability to affect the price of a good
- marginal: value (revenue), expenditure (cost); average expenditure (cost)
- the marginal value schedule, or utility curve, is the demand curve for the good; individual's demand curves slope downward as well
- the supply curve is the average expenditure curve, not the ME curve; upward sloping; shows how much you must pay per unit
- typically will buy a lower quantity at a lower price
- monopoly can charge a P above the MC curve, because it has a downward sloping AR (demand) curve; this means MR is less than AR
- monopsony can purchase a good at a P below its MV because it has an upward sloping AE (supply) curve; ME is greater than AE

#### 6. Monopsony Power

- pure monopsony is not common; few buyers for a many sellers; GM and Ford
- monopsony power is determined in part by the number of buyers in the market; if there is only 1 buyer- pure monopsony- monopsony power depends on the elasticities of

market supply; the less elastic the supply, the more monopsony power the buyers will have

-when there are several buyers, monopsony power also depends on how aggressively they compete for supplies

### ***Monopsony Power***

#### **1. Elasticity of Market Supply**

-less elastic the supply curve the more monopsony power

#### **2. Number of Buyers**

-fewer buyers means more monopsony power

#### **3. Interaction Among Those Buyers**

-more aggressive the competition the less monopsony power they have

-there is deadweight loss from monopsony power; even if the monopsonists' gains were taxed and redistributed to the producers, there would still be inefficiency because of lower output than under competition; this deadweight loss is the social cost of this inefficiency

**\*bilateral monopoly**- market with only 1 seller and 1 buyer; rare, but the monopoly power and monopsony power will contradict each other

### **7. Limiting Market Power: Antitrust Laws**

-direct price regulation is used for natural monopolies, but antitrust laws are used for other monopolies

-sometimes scale economies make pure monopoly desirable; but the government still wants to regulate price to maximize social welfare

-antitrust laws prevent firms from obtaining excessive market power

-monopoly power can arise in many ways: price fixing, parallel conduct, predatory pricing, and many others, merger

**\*parallel conduct**- form of implicit collusion where 1 firm consistently follows actions of another

#### **3 Methods of Enforcement**

1. Antitrust Division of the Department of Justice

2. Administrative Procedures of the FTC

3. Private Treble Suits- sue for 3 times the cost

## Pricing with Market Power

### 1. Capturing Consumer Surplus

-all pricing strategies are means of capturing consumer surplus and transferring it to the producer

#### 3 Main Techniques

1. price discrimination
2. 2-part tariffs
3. bundling

**\*price discrimination-** allows the firm to gain consumer surplus from different consumers at the same time by charging different prices

-firms with market power are in an enviable position because they have the potential to earn huge profits; realizing that potential may depend on pricing strategy however

-even if that firm sets a single price, it needs an estimate of the elasticity of demand for its output; more complicated strategies, which can involve setting several different prices, require even more information about demand

### 2. Price Discrimination

-a pricing strategy aims to enlarge the customer base that the firm can sell to and capture as much consumer surplus as possible; there are a number of ways to do this, and they usually involve setting more than 1 price

**\*reservation price-** the maximum price a customer is willing to pay

#### 3 Forms

##### 1. 1<sup>st</sup> degree

-charging each customer his reservation price

-because each customer is charged exactly what they are willing to pay, MR curve is no longer relevant; the incremental revenue is

-since price discrimination does not affect a firm's cost structure, the cost of each additional unit is again given by the firm's MC curve; therefore, the additional profit from producing and selling an incremental unit is now the difference between demand and marginal cost; as long as demand exceeds MC, the firm can increase profits through increasing production

-all CS is captured by the firm; nearly impossible and impractical in real life

-imperfect discrimination occurs; doctors and accountants charging rich customers more; car salesmen, and universities; charge 6 different prices or so

##### 2. 2<sup>nd</sup> degree

-charging different prices per unit for different quantities of the same good or service

**\*block pricing-** charging different prices for different quantities or blocks of a good; used by power and water companies

-leads to expanded output and scale economies; encouraged by governments increased consumer welfare while allowing the firm greater profit

##### 3. 3<sup>rd</sup> degree

- dividing consumers into 2 or more groups with separate demand curves and charging different prices to each group
- seniors and kids; airlines; special liquors
- in any case, some method must be used to divide consumers into groups: used IDs, ages, labels, ....

## **2 Firm Musts**

1. MR curves must be the same
  2. total output must be such that the MR for each group of consumers is equal to the MC of production
- can be easier to think in terms of relative prices and then relate these to the elasticities of demand

## **3. Intertemporal Price Discrimination and Peak-Load Pricing**

- ideally, the firm would like to price discriminate perfectly; to charge each customer his reservation price; in practice, this is impossible, but other forms of price discrimination are used

**\*intertemporal price discrimination**- separating consumers with different demand functions into different groups by charging different prices at different points in time

- skimming the market with high prices first, then lowering price after demand falters

**\*peak-load pricing**- charging higher prices during peak periods when capacity constraints cause marginal costs to be high

- rather than capturing consumer surplus, the objective is to increase economic efficiency by charging consumers prices that are close to MC

- different from 3<sup>rd</sup> degree discrimination because different time periods are important here; the MC are higher during certain times because of capacity constraints, so peak-load actually increases consumer and producer surplus

## **4. 2-Part Tariff**

- 2-part tariff is another means of capturing consumer surplus; customers must pay an entry fee that allows them to buy the good at a per-unit price
- 2-part tariff is most effective when consumer demands are relatively homogenous
- amusements parks, clubs: entrance and usage fee
- issue is determining and setting the entry and usage fee; always a trade off, lower entrance fee means more usage fees
- firm should usually set the usage fee above MC and set entry fee equal to the remaining consumer surplus of the consumer
- when demands are similar charge a large entry fee and usage fee close to MC (Disney); when demands are different, charge a lower entry fee and usage fee greater than MC
- always new twists in the 2-part tariff dilemma for firms

## **5. Bundling**

- when demands are heterogeneous and negatively correlated, bundling can increase profits; different movie theatres cater to different audiences; so producer bundles 2 movies together

**\*pure bundling**- 2 or more different goods are sold only as a package



- bundling becomes more profitable because the relative valuations of the 2 products are reversed in different markets; the effectiveness of bundling depends on the extent to which demands are negatively correlated
- must determine consumer's reservation prices for each product, and then decide how much to charge; works well when consumer's have a low reservation price and high price for 2 products
- \***mixed bundling**- customer can buy the goods individually or as a package; 3<sup>rd</sup> option
- mixed bundling can be more profitable than pure bundling if marginal costs are significant or if demands are not perfectly correlated
- bundling is a special case of tying
- \***tying**- where products must be sold in some sort of combination; tying can be used to meter demand or to protect customer goodwill associated with a brand name; usually enforced by contracts
- can run into legalities: xerox and paper, franchises must buy from their bosses to protect the brand name

## 6. Advertising

- advertising can further increase profits; the profit maximizing advertising-to-sales ratio is equal in magnitude to the ratio of the advertising and price elasticities of demand
- causes demand curve to shift out and to the right; AC rises because advertising is a fixed cost, and MC stays the same; new AR and MR curves
- must consider additional MC, which include production costs and advertising costs
- \***advertising to sale ratio**- ratio of a firm's advertising expenditures to its sales
- \***advertising elasticity of demand**- % change in quantity demanded resulting from a 1% increase in advertising expenditures
- \***rule of thumb**- to maximize profit, the firm's advertising to sales ratio should be equal to minus the ratio the advertising and price elasticities of demand
- small elasticities of demand will imply large markups and may make advertising worthwhile

## 7. Transfer Prices

- for vertically integrated firms
- \***transfer prices**- internal prices at which parts and components from upstream divisions are sold to downstream divisions within a firm

### 3 Options

#### 1. no outside market

- transfer price equal to MC of upstream division

#### 2. competitive outside market

- MC of the intermediate good is simply the market price

#### 3. non-competitive outside market

- still sell transfers at MC; but sell to outside market at higher prices
- sometimes vertically integrated firms will have monopsony power to purchase from outside markets; this will not be more profitable, because this marginal expenditure will raise the average expenditure for all units bought in the outside market, thus raising the price to that of the transfer price

## Monopolistic Competition and Oligopoly

### 1. Monopolistic Competition

-in the long-run, entry will occur until profits are driven to 0; firms then produce with excess capacity (at output levels below those that minimise average cost)

#### *2 Characteristics of Monopolistic Competition*

1. differentiated products, which are highly substitutable
2. new firms can enter and exist easily

-as with monopolies, firms face downward sloping demand curves; therefore, firms have only a small amount of monopoly power; but this doesn't mean profits, because, like perfect competition, firms can enter easily and thus drive economic profits down to 0

-differences may arise when firms have different costs or certain products are more desirable than others

#### *2 Reasons Monopolistic Competition is Less Efficient than Perfect Comp.*

1. monopoly power creates deadweight loss; equilibrium P exceeds MC
2. firms operate with excess capacity; AC is not minimized; downward sloping demand curve

#### *2 Goods Reasons*

1. market power is usually small, so deadweight loss is small
2. product diversity gains may outweigh inefficiency costs from downward sloping demand curves

### 2. Oligopoly

-in an oligopolistic market, only a few firms account for most or all of production; barriers to entry allow some firms to earn substantial profits, even over the long run; economic decisions involve strategic considerations- each firm must consider how its actions will affect rivals, and how they are likely to react; products may or may not be differentiated

-barriers can result from scale economies, natural barriers, or strategic decisions

-must consider strategic decisions in conjunction with their competitors decisions

#### **Equilibrium in Market**

1. perfect competition- P equating supply with demand
2. monopoly-  $MR=MC$
3. monopolistic competition- long-run equilibrium results from entry of new firms to drive economic profits to 0
4. oligopoly- do their best based on competitors

**\*Nash equilibrium**- set of strategies or actions in which each firm does the best it can given its competitor's actions; used to describe oligopoly; in other markets the firm must do its best it can regardless of its competitors

-this concept can also be applied to markets in which firms produce substitute goods and compete by setting price; in equilibrium, each firm maximizes its profit, given the prices of its competitors, and so has no incentive to change price

**\*duopoly**- market in which 2 firms compete with each other

**\*Cournot model**- firms make their output decisions at the same time, each taking the other's output as fixed; in equilibrium, each firm is maximizing profit given the output of its competitor, so it has no incentive to change its output; the firms are in Nash equilibrium

**\*reaction curve**- relationship between a firm's profit-maximising output and the amount it thinks its competitors will produce

-firms production is usually a decreasing schedule of how much it thinks firm 2 will produce

**\*Cournot equilibrium**- equilibrium in the Cournot model, in which each firm correctly assumes how much its competitor will produce and sets its own production level accordingly; intersection between Firm 1 and Firm 2 reaction curves; example of Nash equilibrium

-does not account for adjustment process

### ***Cournot Rational When***

1. firms will set output levels only once

2. rational when firms are already in Cournot equilibrium

-the Cournot model must be confined to use when firms are in equilibrium

-Cournot model produces better results than when firms engage in perfect competition, but not as good as when firms engage in collusion

**\*Stackleberg model**- 1 firm sets its output first; that firm has a strategic advantage and earns a higher profit; it knows it can choose a large output and that its competitors will have to choose small outputs if they want to maximize profits; first-mover model

**\*fait accompli**- going first has an advantage; if you set your output at large, then the competitor has to produce a smaller amount to keep prices high; IBM uses this

### **3. Price Competition**

-firms would earn higher profits by collusively agreeing to raise price, but the antitrust laws usually prohibit this

-many times, firms will battle over price rather than output

**\*Bertrand model**- oligopoly model in which firms produce a homogeneous good, each firm treats the price of its competitors as fixed, and all firms decide simultaneously what price to charge; differs from Cournot in that firms choose P, not Q

-price can't be higher than MC, because if it was, one firm would lower their P to capture all the market share, and price wars would start (with homogeneous products)

### ***2 Criticisms of Bertrand***

1. firms producing homogeneous goods set Q not P

2. no reason to naturally assume that sales would be equal anyways

-with differentiated products however, and setting P first, the firm that moves first is at a distinct disadvantage; the second firm can simply undercut P and capture a larger market share

### **4. Competition v. Collusion: The Prisoners' Dilemma**

-a Nash equilibrium is a no cooperative equilibrium: each firm makes the decisions that give it the highest possible profit, given the actions of its competitors

-they might all set a high price without colluding, each hoping its competitors will do the same, but they are in the prisoner's dilemma which makes this unlikely; each firm has an incentive to cheat by lowering its price and capturing sales from competitors

**\*no cooperative game-** game in which negotiation and enforcement of binding contracts is not possible

**\*payoff matrix-** table showing profit or payoff to each firm given its decision and the decision of its competitor

**\*prisoner's dilemma-** game theory example in which 2 deserted islanders must decide separately to kill each other or live together; lighter sentences for working together, but better for each other by working independently

-oligopolistic firms often find themselves in the prisoner's dilemma; aggressive or passive competition; if they compete passively and implicitly collude prices, they will make more profits; however, each firm has an incentive to fink to undercut its competitors

### 5. Implications of the Prisoner's Dilemma

-the prisoner's dilemma creates a price rigidity in oligopolistic markets; firms are reluctant to change prices for fear of setting off price warfare

-however, the firm does not have only 1 opportunity to set prices; they can build a reputation over years for their price strategy

-implicit collusion is often short-lived; competitors often distrust each other, and will make different assumptions about prices and costs

**\*price rigidity-** characteristic of oligopolistic markets by which firms are reluctant to change prices even if costs or demands change; because implicit collusion can be fragile

**\*kinked demand curve model-** oligopoly model in which each firm faces a demand curve kinked at the currently prevailing price; at higher prices demand is very elastic, whereas at lower prices it is inelastic; because the demand curve is kinked, the MR curve is discontinuous, as a result, a firm's costs can change without an increase in P; MC can increase but still equal MR, so P stays the same

-used as a description of price rigidity not an explanation of; prisoner's dilemma and firm's desires to avoid mutually destructive price competition explain it

**\*price signalling-** form of implicit collusion in which a firm announces a price increase in the hope that other firms will follow suit; difficult to ensure firms agree with other on implicit price collusion

**\*price leadership-** pattern of pricing in which 1 firm regularly announces price changes that other firms then match

-price leadership is a form of implicit collusion that sometimes gets around the prisoner's dilemma; 1 firm sets a price and all other follow suit

-signalling and leadership are extreme and may lead to antitrust lawsuits; but some industries dictate it (GM in autos), and in some there is natural reluctance to change prices so a leader is needed (banking)

**\*dominant firm-** firm with a large share of total sales that sets price to maximise profits taking into account the supply response of smaller firms; must set its demand curve first and then let the smaller firms serving smaller markets follow suit

## 6. Cartels

-in a cartel, producers explicitly collude in setting prices and output levels; successful cartelisation requires that the total demand not be very price elastic, and that either the supply of the cartels or the supply of the noncartel be inelastic

-not all producers need to join, but if enough do they can drive prices up; usually international

-some cartels with precious metals and oil have succeeded; but most cartels have not worked

### *2 Conditions for Cartel Success*

1. stable conditions where producers agree

2. must be monopoly power available; most important

-CIPEC copper cartel did not work while OPEC oil cartel did, because copper prices are more elastic than oil prices

## Game Theory and Competitive Strategy

### 1. Gaming and Strategic Decisions

-a game is cooperative if the players can communicate and arrange binding contracts; otherwise it is no cooperative

-can be between people or firms; based on notion of prisoner's dilemma

\***game**- situation in which players (participants) make strategic decisions that take into account each other's actions and responses

\***payoff**- outcome of a game that generates rewards or benefits for the player

\***strategy**- rule or plan of action for playing a game

\***optimal strategy**- strategy that maximises player's expected payoff

-in either kind of game, the most important aspect of strategy decision is understanding your opponent's position, and correctly deducing the likely response to your actions; misjudging an opponent's position is a common mistake

\***no cooperative game**- game in which negotiation and enforcement of binding contracts between players is not possible; price wars between firms

\***cooperative game**- game in which negotiation and enforcement of binding contracts between players is possible; individual buying a car

-no cooperative games are more prevalent; must understand your opponent's point of view, and deduce his or her likely responses to your actions

-given some behavioural assumptions, we can determine the best strategy for each firm

-game where students bid on a \$1 bill

### 2. Dominant Strategies

-not every game has a dominant strategy for every player

-when 1 firm doesn't have an optimal strategy, it may have strategies that defend against what the other firm does

\***dominant strategies**- strategy that is optimal no matter what an opponent does

\***equilibrium in dominant strategies**- outcome of a game in which each firm is doing the best it can regardless of what its competitors are doing

-dominant strategies dictate that each firm does their best no matter what the other firms are doing

### 3. Nash Equilibrium Revisited

-dominant strategies are stable, but everyone doesn't have one

-a Nash equilibrium is a set of strategies such that all players are doing their best given the strategies of other players; contrast to dominant strategies

-an equilibrium in dominant strategies is a special case of a Nash equilibrium; a dominant strategy is optimal no matter what the other players do; a Nash equilibrium relies on the rationality of each player

\***maximin strategy**- is more conservative because it maximises the minimum possible outcome

-for example, in a choice between 2 products, it does the firm best to wait and see which one their competitor is going to do before doing theirs

**\*pure strategy-** strategy in which a player makes a specific choice or takes a specific action

**\*mixed strategy-** strategy in which a player makes a random choice among 2 or more alternatives, based on a set of chosen probabilities; not reasonable for real life, good for poker and other games

-some games have no Nash equilibria in pure strategies but have 1 or more equilibria in mixed strategies; a mixed strategy is one where the player makes a random choice among 2 or more possible actions, based on a set of chosen probabilities

#### 4. Repeated Games

-strategies not optimal for 1 shot games can use repeated games

**\*tit-for-tat strategy-** in which you play cooperatively as long as your competitor does the same, may be optimal for the repeated prisoner's dilemma; cooperate with cooperating opponents and retaliating against uncooperative ones

-common when firms face pricing decisions every period; most common form in businesses

-with infinite repetition in the game, the expected gains from cooperating outweigh those from undercutting

-for finite games, sometimes undercutting can work

#### 5. Sequential Games

-in a sequential game, the players move in turn; in some cases, the player who moves first has an advantage; players may then have the incentive to try to precommit themselves to particular actions before their competitors can do the same; Stackleburg model

**\*extensive form of a game-** representation of possible moves in a game in the form of a decision tree

#### 6. Threats, Commitments, and Credibility

-developing the right reputation is very important

**\*empty threat-** one that has no incentive to carry out; if one's competitors are rational, empty threats are of no value

-to make a threat credible, it is sometimes necessary to make a strategic move to constrain one's later behaviour, thereby creating an incentive to carry out the threat

-commitment leads to credibility

#### 7. Entry Deterrence

-to deter entry, an incumbent firm must convince any potential competitor that entry will be unprofitable; this may be done by investing, and thereby giving credibility to the threat that entry will be met by price warfare; strategic trade policies by governments sometimes have this objective

-economies of scale, patents, and copyrights are deterrents

-rational industry actions can break down after entry occurs; in the best entrance to maintain prices and accommodate the new player

-strategic trade policy also presents itself in international competition

## 8. Bargaining Strategy

-bargaining situations are examples of cooperative games; as in noncooperative games, in bargaining players can sometimes gain a strategic advantage by limiting their own flexibility

-outcomes can rely on either side's ability to make a strategic move that alters its relative bargaining position

## 9. Auctions

-auctions can be conducted in a number of formats

\***auction markets**- markets in which products are bought and sold through formal bidding processes

\***English**- oral auction with progressively increasing bids

\***Dutch**- oral auction with progressively decreasing bids

\***sealed bid**- first-price (selling price equal to highest bid) or second price (selling price equal to second highest bid)

-the opportunity for a seller to raise revenue and for a buyer to obtain an object at a reasonable price depends on the auction format, and on whether the items being auctioned have the same value to all bidders (common-value auction) or different values to different bidders (private-value auction)

\***common-value**- winning bidder is the person with the largest positive error

\***private-value**- bid until you reach your reservation price

\***winner's curse**- the winner of a common-value auction is often worse off because they paid too much due to over optimism

### Maximize Auction Revenue

1. encourage as many bidders as possible
2. use English auction, and reveal as much information as possible



## Markets for Factor Inputs

### 1. Competitive Factor Markets

-a competitive factor market is one where there are large suppliers and buyers of a factor of production, such as labour or raw materials

-individuals and markets have factor demand curves

-like demand curves for final products, factor demand curves are downward sloping, but they are also derived demand curves

**\*derived demand curve**- demand for an input that depends on, and is derived from, both the firm's level of output and the cost of inputs

**\*marginal revenue product, K,L**- additional revenue resulting from the sale of output created by the use of 1 additional unit of an output; downward sloping; tells us how much we should pay for the next unit

-in a competitive input market, the demand for an input is given by the marginal revenue product, the product of the firm's marginal revenue, and the marginal input of the product

-competitive markets have downward sloping MRP curves because MPL is diminishing; monopolistic markets have downward sloping MRP curves because MPL and MR fall

-a firm in a competitive labour market will hire workers to the point at which the marginal revenue product of labour is equal to the wage rate; this principle is analogous to the profit-maximising output condition that production be increased to the point at which  $MR = MC$

-inputs and outputs will still be chosen so  $MR = MC$

-the market demand for an input is the horizontal sum of the industry demands for the input; but industry demand is not the horizontal sum of the demands of all firms in the industry; to determine industry demand, one must take into account the fact that the market price will change in response to changes in the price of a product

-when capital inputs are variable in the long-run, there is a greater elasticity of demand because firms can substitute capital for labour in the production process

-the industry demand curve when prices change with wage rates is more inelastic than the demand curve that would be obtained if the product prices were assumed to be unchanged; it increases less

-when factor markets are competitive, the buyer of an input assumes that its purchases will have no effect on its price; as a result, the firm's marginal expenditure and average expenditure curves are both perfectly elastic

**\*average expenditure curve**- supply curve representing the price per unit that a firm pays for a good

**\*marginal expenditure curve**- curve describing the incremental costs of purchasing 1 additional unit of a good

-the market supply of a factor such as labour needs not be upward sloping; a backward-bending labour supply curve can result if the income effect associated with a higher wage rate (more leisure is demanded because it is a normal good) is greater than the substitution effect (less leisure is demanded because its price has gone up)

-price increase of a good has 2 effects: income effect and substitution effect

## 2. Equilibrium in a Competitive Factor Market

-in a perfectly competitive market the price of the inputs should equate the quantity demanded to quantity supplied

-efficiency is achieved in a perfectly competitive market is achieved because the sum of the aggregate CS and PS is maximised;  $MRP = MP * P$

-when  $MRP$  doesn't =  $MP * P$ , the market is not perfectly competitive; more workers need to be employed or fired to bring optimal efficiency back

\***economic rent**- the difference between the payments to factors of production and the minimum payment that would be needed to employ them; in a labour market, rent is measured by the area below the wage level and above the marginal expenditure curve

-if the supply curve were perfectly elastic, economic rent would be 0; rents only arise when supply is somewhat inelastic; when supply is perfectly inelastic, all payments to a factor of production are economic rents because the factor will be supplied no matter what price is paid

-land is an inelastically supplied factor; supply curve is inelastic because land is fixed in the short-run

-the economic rent associated with the employment of labour is the excess of wages paid over above the minimum amount needed to hire workers

## 3. Factor Markets with Monopsony Power

-when a buyer of an input has monopsony power, the ME curve lies above the AE curve, which reflects the fact that the monopsonist must pay a higher price to attract more of the input into employment

-firm should buy to where  $MRP = ME$

-government and big companies are monopsonists some times; big businesses, only employer in the region

-setting a minimum wage in a perfectly competitive market can create unemployment and a deadweight loss

## 4. Factor Markets with Monopoly Power

-when the input seller is a monopolist such as a labour union, the seller chooses the point on the MR product curve that best suits its objective; maximisation of employment, economic rent, and wages are 3 plausible objectives for labour unions

-the seller of a product has monopoly power, he can charge a price above MC

-when a monopolistic union bargains with a monopsonistic employer, the wage rate depends on the nature of the bargaining process; there is little reason to believe that the competitive outcome will be achieved

-can either pursue a rent maximisation policy or a maximise aggregate wages policy

-when the monopolist union raises wages in the unionised sector of the economy, employment in that sector falls; this hurts nonunionised workers

## Investment, Time, and Capital Markets

-risk premiums must be added to risky investments; effective yield of a bond is the total return you are receiving on the perpetuity

\***asset beta**- constant that measures the sensitivity of an asset's return to market movements, and thus its nondiversifiable risk; CAPM

-consumers must consider future operating costs just like businesses when buying durable goods

-an exhaustible resource in the ground is like money in the bank and must earn a comparable return; therefore, if the market is competitive,  $P - MEC$  (marginal extraction cost) will grow at the rate of interest

-an intertemporal resources is one where production today affects sales or costs in the future

\***user cost**-  $P - MC$ ; opportunity cost of depleting a unit of the resource; this must rise at the rate of interest

-monopolists are more conservationist when it comes to depletable resources; they charge a higher price and deplete the resources more slowly

-market interest rates are determined by the demand and supply of loanable funds; households supply funds and households, governments, and firms demand funds

### Variety of Interest Rates

1. treasury bill rate
2. treasury bond rate
3. discount rate
4. commercial paper rate
5. prime rate
6. corporate bond rate

# IV. Information, Market Failure, and the Role of the Government

## General Equilibrium and Economic Efficiency

### 1. General Equilibrium Analysis

**\*partial equilibrium analysis**-examines prices and quantities in market independently, assuming that related markets are unaffected

**\*general equilibrium analysis**- examines all prices and quantities in relevant markets simultaneously, taking into account feedback effects of other markets on the market being studied; takes into account interrelationships

-in practice, not feasible; but can analyze effect on 2 or 3 other markets

-when markets are interdependent, the prices of all products must be determined simultaneously

-takes into account effects on substitutes and complements; must attain movements simultaneously because of the feedback effects

-if the goods are complements, a partial equilibrium analysis will overstate the impact of a tax

### 2. Efficiency in Exchange

**\*exchange economy**- market in which 2 or more consumers trade 2 goods among themselves

**\*efficient allocation**- allocation of goods in which no one can be made better off unless someone else is made worse off; Pareto efficiency

-when consumers all make mutually advantageous trades, the outcome is Pareto efficient and lies on the contract curve

-an allocation of goods is efficient only when the goods are distributed so that the marginal rate of substitution between any pair of goods is the same for all consumers

**\*Edgeworth box**- diagram showing all possible allocations of either 2 goods between 2 people or of 2 inputs between 2 production processes; illustrates the possibilities for both consumers to increase their satisfaction by trading goods

-even if a trade from an inefficient allocation makes both people better off, the new allocation is not necessarily efficient

**\*contract curve-** curve showing all efficient allocations of goods between 2 consumers, or of 2 inputs between 2 production functions; contains all allocations for which consumers' indifference curves are tangent

-these allocations are efficient if there is no way to reallocate goods to make someone better off without making someone else worse off

-once a point on the contract curve has been chosen, cannot move to a different point without making someone worse off; Pareto Efficiency

-if a change makes someone worse off, as long as another change occurs, and the combined changes leave someone better off and no one worse off all is good

**\*excess demand-** when the quantity demanded of a good exceeds the quantity supplied

**\*excess supply-** when the quantity supplied of a good exceeds quantity demanded

-a competitive equilibrium describes a set of prices and quantities: when each consumer chooses his most preferred allocation, the quantity demanded is equal to the quantity supplied in every market; all competitive equilibrium allocations lie on the exchange contract curve and are Pareto efficient

-in a 2 person exchange, there is room for bargaining power

-the allocation in a competitive equilibrium is economically efficient

**\*invisible hand-** Adam Smith's innovation; states that no government intervention is needed because the economy will automatically allocate resources efficiently; commonly forms the starting point for economic intervention discussions

**\*welfare economics-** normative evaluation of markets and economic policy

**\*first theorem of welfare economics-** states that in the competitive marketplace, all mutually beneficial trades will be completed and the resulting equilibrium allocation of resources will be economically efficient

### 3. Equity and Efficiency

-how do we find the most equitable allocation for all people, if the perfectly competitive market doesn't provide an efficient allocation

**\*utility possibilities frontier-** curve showing all efficient allocations of resources measured in terms of the utility levels of 2 individuals

-although both individuals prefer some allocations to an inefficient allocation, not every efficient allocation must be preferred; thus, an inefficient allocation can be more equitable than an efficient one

-the problem is that what is an equitable allocation; different opinions exist

**\*social welfare function-** weights applied to each individual's utility in determining what is socially desirable

### 4 Views of Equity

1. egalitarian- all members of society receive equal amounts of goods

2. rawlsian- maximise the utility of the least well-off person

3. utilitarian- maximise the total utility of all members of society

4. market-oriented- the market outcome is most equitable

-because a competitive equilibrium need not be equitable, the government may wish to help redistribute wealth from the rich to the poor; because such redistribution is costly, there is some conflict between equity and efficiency

**\*second theorem of welfare economics**- if individual differences are convex, then every efficient allocation (every point on the contract curve) is a competitive equilibrium for some initial allocation of goods

-the issue is that all programs that redistribute income, like taxes and transfer payments, are costly and in themselves reduce generate inefficiencies

#### 4. Efficiency in Production

-after ensuring efficient allocation of final goods, the production inputs must allocated efficiently as well

**\*technical efficiency**- when firms combine inputs to produce a given output as inexpensively as possible

-an allocation of production inputs is technically efficient if the output of 1 good cannot be increased without decreasing the output of another; all points of technical efficiency lie on the production contract curve and represent points of tangency of the isoquants for the 2 goods

**\*production contract curve**- curve showing all technically efficient combinations of inputs

-a competitive equilibrium in input markets occurs when the marginal rate of technical substitution between pairs of inputs is equal to the ratio of the prices of the inputs

-the competitive equilibrium lies on the production contract curve, and the competitive equilibrium is efficient in production

**\*production possibilities frontier**- curve showing the combinations of 2 goods that can be produced with fixed quantities of inputs; shows all efficient allocations

-the PPF is concave, downward sloping, because its slope (MRT), increases as the level of production of the good increases

-the slope of the PPF measures the marginal cost of producing 1 good relative to the MC of producing another

**\*marginal rate of transformation**-amount of 1 good that must be given up to produce 1 additional unit of a second good; MC to MC

-so the MRT of food for clothing increases as more food and less clothing is produced

-efficiency in the allocation of goods to consumers is achieved only when the MRS marginal rate of substitution of 1 good for another in consumption (which is the same for all consumers) is equal to the MRT marginal rate of transformation of 1 good for another in production

-when input and output markets are perfectly competitive, the MRS (which equals the ratio of the prices of the goods) will equal the MRT (which equals the ratio of the MCs of producing the goods)

-goods must be produced in combinations that match people's willingness to pay for them

-in a competitive output market, people consume to the point where their MRS is equal to the price ratio; producers choose outputs so that the MRT is equal to the price ratio; because the MRS equals the MRT, the competitive output market is efficient; any other price ratio will lead to an excess demand for 1 good and an excess supply of the other

## 5. Gains from Free Trade

-free international trade expands a country's production possibilities frontier; as a result, consumers are better off

\***absolute advantage**- situation in which country 1 has an advantage over country 2 in producing a good because the cost of producing the good in 1 is lower than the cost of producing the good in 2

\***comparative advantage**- situation in which country 1 has an advantage over country 2 in producing a good because the cost of producing the good in 1, relative to the cost of producing other goods in 1, is lower than the cost of producing the good in 2, relative to the cost of producing other goods in 2

-international trade will cause disruptions in the work force; imported goods will cause people to lose jobs in those industries, but other jobs will spring up to support the imported goods; there will just be some time to adjust

## 6. The Efficiency of Competitive Markets

-competitive markets may be inefficient for several reasons

### 2 Conclusions

1. theorem 1; for any initial allocation of resources, a competitive market will achieve an economically efficient outcome via exchange, input markets, or output markets
2. theorem 2; with convex consumer preferences, any efficient allocation can be achieved with a suitable redistribution of resources

### 3 Efficiencies

1. efficiency in exchange
2. efficiency in the use of inputs for production
3. efficiency in the output market

## 7. Why Markets Fail

### 4 Reasons

1. **market power**- whenever a producer or supplier has it
2. **incomplete information**- when consumers don't have it
3. **externalities**- could be anything
4. **public goods**- public patents, roads; hard to prevent other people from using it

## Markets with Asymmetric Information

### 1. Quality Uncertainty and the Market for Lemons

- the seller of a product often has better information about its quality than a buyer; asymmetric information of this type creates a market failure in which bad products tend to drive good products out of the market;
- market failure can be eliminated if sellers offer standardized products, provide guarantees or warranties, or find other ways to maintain good reputations for their products
- when sellers of products have better information about product quality than buyers, a lemons problem may arise in which low-quality goods drive out high-quality goods
- \***adverse selection**- form of market failure resulting from asymmetric information: if insurance companies must charge a single premium because they cannot distinguish between high-risk and low-risk individuals, more high-risk individuals will insure, making it unprofitable to sell insurance
- insurance markets frequently involve asymmetric information because the insuring party has better information about the risk involved than the insurance company; this can lead to adverse selection, in which poor risks choose to insure and good risks do not; another problem for insurance markets is moral hazard, in which the insuring party takes less care to avoid losses after insuring
- asymmetric information is also present in credit markets, retail stores, antique dealers, construction, and restaurants; as a result, reputation and standardisation become extremely important in maintaining efficient markets

### 2. Market Signalling

- sellers can deal with the problem of asymmetric information by sending buyers signals about the quality of their products; for example, workers can signal their high productivity by obtaining high levels of education
- \***market signalling**- process by which sellers send signals to buyers conveying information about product quality
- to be a strong signal, it must be easier for high-productivity people to give than for low-productivity people to give, so that high-productivity people are more likely to give it
- dressing well is a weak signal, education is a strong signal
- cost of education is greater for low-productivity people: takes them longer, less studious
- even if education does not increase productivity, it still is a strong signal
- firms signal with guarantees and warranties

### 3. Moral Hazard

- moral hazard alters the ability of markets to allocate resources effectively
- \***moral hazard**- when an insured party whose actions are unobserved can affect the probability or magnitude of a payment associated with an event
- getting insurance and then not caring as much because you are insured



#### 4. Principal-Agent Problem

-asymmetric information can make it costly for the owners of firms (principles) to monitor accurately the behaviour of their managers (agents); managers may seek higher fringe benefits for themselves, or a goal of sales maximisation, even though shareholders would prefer to maximise profit

-an agency relationship exists whenever there is an arrangement in which one person's welfare depends on what another person does

-doctors, insured people, and housing managers are all agents

##### Private Enterprise Solutions

1. vote a new board
2. corporate takeovers
3. managers make more money doing their job correctly

##### Public Enterprise Solutions

1. more difficult to monitor; checks and balances
2. people supposedly serving for the public good to begin with
3. in the public's view
4. oversight governmental agencies

-can use either revenue-sharing or bonus payment systems

-owners can avoid some principal-agent problems by designing contracts that give their agents the incentives to perform productively

#### 5. Managerial Incentives in an Integrated Firm

-incentives differ slightly when dealing with integrated firms

\***horizontal integration**- organizational form in which several plants produce the same or related products for a firm; flat; many bosses

\***vertical integration**- organisational form in which a firm contains several divisions, with some producing parts and components that others will use to produce finished products; tall; 1 boss

-transfer pricing in the vertically integrated firm can present some of these issues

-division managers will have better information than central managers

##### 2 Issues in Integrated Firms

1. how can central management get accurate operating costs and production potential

2. what reward or incentive system should be used to encourage efficient production

-first ask about costs, then reward based on performance; give bonuses based on total output per plant or operating profit

-issues may arise then with managers underestimating capacity

-salespeople have issues regarding compensation as well

#### 6. Asymmetric Information in Labour Markets: Efficiency Wage Theory

-asymmetric information can explain why labour markets have unemployment even though some workers are actively seeking work; according to efficiency wage theory, a wage higher than the competitive wage (efficiency wage) increases worker productivity by discouraging workers from shirking on the job

\***efficiency wage theory**- explanation for the presence of unemployment and wage discrimination which recognizes that labour productivity may be affected by the wage rate

**\*shirking model-** principle that workers still have an incentive to shirk if a firm pays them a market-clearing wage, because fired workers can be hired somewhere else for the same wage

**\*efficiency wage-** wage that an firm will pay to an employee as an incentive not to shirk  
-the no shirking constraint NSC gives the wage workers need to be paid to not shirk on the job

-there will always be some unemployment in equilibrium, as firms must pay slightly higher than market wages to avoid shirking problem, which means less wages available to pay workers

## Externalities and Public Goods

### 1. Externalities

-externalities can be positive (pretty garden, too little production) or negative (river waste, too much production)

**\*externality-** occurs when a producer or a consumer affects the production or consumption activities of others in a manner that is not directly reflected in the market price

**\*marginal external cost MEC-** increase in cost imposed externally as 1 or more firms increases output by 1 unit

**\*marginal social cost MSC-** sum of the MC of production and marginal external cost  
-when there are negative externalities, the MSC is higher than the MC; the difference is the MEC

-negative externalities generate both long-run and short-run inefficiencies; negative externalities encourage too many firms to stay in the industry

**\*marginal external benefit MEB-** increased benefit that accrues to other parties as a firm increases output by 1 unit

**\*marginal social benefit MSB-** sum of the marginal private benefit MPB and MEB  
-positive externalities result in too little production; a firm does R&D and other firms don't have to now

-when there are positive externalities, MSB are higher than marginal benefits; the difference is MEB

-externalities cause market inefficiencies because they inhibit the ability of market prices to convey accurate information about how much to produce and how much to pay

### 2. Ways of Correcting Market Failure

-if the firm that generates the externality has a fixed-proportions production technology, the externality can be reduced only by encouraging the firm to produce less

-pollution is a common example of an externality that leads to market failure; it can be corrected by emissions standards, fees, marketable emissions permits, or by encouraging recycling; when there is uncertainty about costs and benefits, any one of these mechanisms can be preferable, depending on the shape of the marginal social cost and marginal benefit curves

-the efficient level of factory emissions is the level that equates the MSC of emissions to the benefit associated with lower abatement cost MCA marginal cost of abatement

#### *4 Ways to Correct Market Failure*

**1. emission fees-** charge levied on each unit of a firm's emissions

**2. emission standards-** legal limit on the amount of pollution that a firm can emit

**3. transferable emissions permits-** system of marketable permits, allocated among firms, specifying the maximum level of emissions that can be generated

**4. recycling-** can work if there is a need to conserve the virgin materials

- US usually uses standards, but other countries use fees; when the government has limited information about the costs and benefits of pollution abatement, a standard or fee may be preferable; the standard is preferable when the MSC curve is steep and MCA curve is relatively flat
- transferable emissions permits create a market for externalities; combines system of fees with standards
- \***refundable deposit**- initial deposit is paid when glass is bought, and is returned when the glass is returned

### 3. Externalities and Property Rights

- inefficiencies due to market failure may be eliminated through private bargaining among the affected parties or through other legal statutes; bargaining is unlikely to generate an efficient outcome because parties frequently behave strategically
- \***property rights**- legal rules stating what people or firms may do with their property
- \***Coase theorem**- principle that when parties can bargain without cost and to their mutual advantage, the resulting outcome will be efficient regardless of how property rights are specified
- the bargaining solution will be effective when property rights are clearly specified, when transaction costs are 0, and when there is no strategic behaviour

### 4. Common Property Resources

- common property resources are not controlled by a single person and can be used without a price being paid; as a result of free usage, an externality is created in which the current overuse of the resource harms those who might use it in the future
- \***common property resource**- resource to which anyone has free access
- when a common property resource, such as a fishery, is accessible to all, the resource is used up to a point at which the private cost is equal to the additional revenue generated; this usage exceeds the efficient level at which the MSC of using the resource is equal to the marginal benefit (as given by the demand curve)
- common solution is to let 1 person manage it, but this is impossible for vast resources; in these cases, government ownership or intervention is needed

### 5. Public Goods

- goods that private markets are not likely to produce efficiently are either nonrival or nonexclusive goods; public goods are both; government must produce
- \***public goods**- nonexclusive and nonrival goods
- \***nonrival goods** - good for which the MC of its provision to an additional consumer is 0; public television or highways
- \***nonexclusive goods** - goods that people cannot be excluded from consuming, so that it is difficult or impossible to charge for their use; national defence, oceans
- \***free rider**- consumer or producer who does not pay for a nonexclusive good in the expectation that others will; new program that benefits some in the community more
- a public good is provided efficiently when the vertical sum of the individual demands for the public good is equal to the MC of producing it

**6. Private Preferences for Public Goods**

- majority-rule voting is 1 way for citizens to voice their preference for public goods; under majority rule, the level of spending provided will be that preferred by the median voter; this level need not be the efficient outcome
- government can issue taxes, but the people must communicate what they want taxed; the willingness to pay measures the CS that the citizen enjoys when a particular level of spending is chosen
- majority rule is inefficient because it weighs each citizen's preferences equally; the efficient outcome weighs each citizen's vote by his or her strength of preference

# Macroeconomics

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**4 Most Important Lessons**

1. in the long-run, a country's capacity to produce goods and services determines the standard of living of its citizens
2. in the short run, AD influences the amount of goods and services that a country produces
3. in the long run, the rate of money growth determines the rate of inflation, but it does not affect the rate of unemployment
4. in the short run, policymakers who control monetary and fiscal policy face a tradeoff between inflation and unemployment

**4 Unresolved Questions**

1. how should policymakers try to raise the economy's natural rate of output
2. should policymakers try to stabilise the economy
3. how costly is inflation, and how costly is reducing inflation
4. how big a problem is government debt

# I. Introduction

## The Science of Macroeconomics

### 1. What Macroeconomists Study

- macroeconomics is the study of the economy as a whole; plays an important role in political debate
- includes growth in incomes, changes in prices, and the rate of unemployment
- must explain economic events and devise strategies to improve economic performance
- must apply same principles to changing circumstances

### 3 Primary Macroeconomic Variables

1. real gross domestic product GDP
  2. inflation rate
  3. unemployment rate
- depressions are severe recessions
  - \***deflation**- periods of falling prices
  - as of lately inflation has been the norm
  - always some unemployment

### 2. How Macroeconomists Think

- has a terminology, data, and way of thinking like all sciences
- to understand the economy, economists use models; theories that simplify reality in order to reveal how exogenous variables influence endogenous variables; the art of the science is judging whether the model captures the important economic relationships for the issue
- model is sort of like a toy, but can attempt to disregard irrelevant information; explain economic variables mathematically
- a key feature of macroeconomic models is whether it assumes that prices are sticky or flexible; models with flexible prices describe the economy in the long run, and models with sticky prices describe the economy in the short run
- the speed with which wages and prices adjust
- \***market clearing models**- assume that prices adjust quickly to bring the market to an equilibrium of supply and demand
- continuous market clearing is not realistic; many prices and wages are set for fixed periods and regulated by law
- market clearing models assume prices are flexible, in reality they are sticky
- \***flexible prices**- adjust quickly to equilibrium
- \***sticky prices**- adjust slowly



- microeconomics is the study of how firms and individuals make decisions and how these decision makers interact; use many of the same tools because macroeconomic events arise from microeconomic interactions
- central assumption is that individuals optimize for best utility
- for many microeconomic models, the microeconomic assumptions underlying the model are considered implicitly (givens), not explicitly
- commonly use supply and demand curve graphs
- study: impact of labour unions on unemployment, effect of inflation on interest rates, and the influence of trade policy on the trade balance and exchange rates

## The Data of Macroeconomics

### 1. Measuring the Value of Economic Activity: Gross Domestic Product GDP

-considered best indicator of economic health: collected every 3 months from primary sources

-GDP measures both the income of everyone in the economy and the total expenditure on the economy's output of goods and services

\***national income accounting**- accounting system used to measure GDP and many related statistics

-to get gross domestic product, must only include value of final goods and services

#### Special Circumstances

1. used goods resold is not counted

2. inventoried goods are counted as expenditures (assuming no spoilage)

3. total value added of all goods; no intermediate sales

4. imputations: home owners (renting themselves), government services at cost

-no imputations for other rents (car, home meals), underground economy

-the underground economy can vary widely from country to country

\***nominal GDP**- values of goods and services at current prices

\***real GDP**- values of goods and services at constant prices (inflation adjusted); uses base year prices

-real GDP rises only when the amount of goods and services has increased; nominal GDP can rise either because output or prices has increased

\***GDP deflator**- nominal GDP/real GDP; implicit price deflator; reflects what's

happening to overall prices; deflates (takes out inflation) of nominal GDP to get real GDP

-changes the base year every 5 years

\***chain-weighting**- chain weights averages to calculate base year for real GDP; little difference, because prices change slowly over time

#### 4 Categories of GDP

##### 1. Consumption (C)

-goods and services bought by households: nondurable goods, durable goods, services

##### 2. Investment (I)

-goods bought for future use: business fixed investment, residential fixed investment, and inventory investment

##### 3. Government Purchases (G)

-goods and services bought by local, state, and federal government: military equipment, highways, and other services from government workers; does not include transfer payments (social security and food stamps)

##### 4. Net Exports (NX)

-accounts for trade with other countries

\***national income accounts identity**-  $Y \text{ (GDP)} = C + I + G + NX$

#### Other Income Measures

##### 1. Gross National Product

$GNP = GDP + \text{factor payments from abroad} - \text{factor payments to abroad}$

-nationals everywhere; GDP is on domestic soil

## 2. Net National Product

NNP= GNP - depreciation

-consumption of fixed capital (depreciation) is 10% of GNP; shows net result of economic activity

## 3. National Income

NI= NNP – indirect business taxes

-indirect business taxes (sales taxes) comprise 10% of NNP; total income to firms

### 5 categories of NI

1. compensation of employees 70%
2. proprietor's income 9%
3. rental income 2%
4. corporate profits 12%
5. net interest 7%

## 4. Personal Income

PI= NI – corporate profits – social insurance contributions – net interest + dividends + government transfers to individuals + personal interest income

-income households and noncorporate businesses receive

## 5. Disposable Personal Income

DPI= PI – personal tax and nontax payments

-subtract personal tax payments and certain nontax payments (parking tickets)

-GDP follows a seasonal pattern; rises at 4<sup>th</sup> quarter and drops in 1<sup>st</sup> quarter; some measures are seasonally adjusted

## 2. Measuring the Cost of Living: Consumer Price Index CPI

-increase in the overall level of prices is inflation

-most commonly used price measure is the CPI

-the CPI measures the price of a fixed basket of goods and services purchased by a typical consumer; like the GDP deflator, the CPI measures the overall level of prices

-collects prices for different goods and services and assigns them weights based on usage (more frequently used get heavier weights)

### 3 Differences with CPI and GDP Deflator

1. GDP deflator is all goods and services, and CPI is those bought by consumers; purchases by firms and governments will not show up in CPI
2. GDP deflator only includes domestic goods; CPI accounts for foreign purchases
3. CPI is fixed basket and GDP is changing basket

\***Laspeyres index**- price index with a fixed basket; overstates increases in cost of living; does not account for substitutes; CPI

\***Paasche index**- price index with a changing basket; understates cost of living; does not account for welfare loss from using substitutes; GDP Deflator

-many things like COLA and social security are based on CPI; does not account for changes in quality or new products; overstates inflation by around 1%

## 3. Measuring Joblessness: Unemployment Rate

-economy's workers are its key resource

-the unemployment rate shows what fraction of those who would like to work do not have a job; when the unemployment rate rises, real GDP typically grows slower than its normal rate and may even fall

\***labour force**- employed and unemployed; not interested (disgruntleds, retirees, or students) do not count

\***unemployment rate**-  $\# \text{ unemployed} / \text{labour force} * 100\%$

\***labour-force participation rate**-  $\text{labour force} / \text{adult population} * 100\%$

-computed for all types of ethnic and sex groups

\*Okun's law- negative relationship between GDP and unemployment rate

$\% \text{ change in real GDP} = 3\% - 2 * \text{change in unemployment rate}$

-so no change in unemployment rate should lead to a 3% increase in real GDP

## II. Classical Theory: The Economy in the Long Run

### National Income: Where it Comes From and Where it Goes

#### 1. What Determines Total Production of Goods and Services

- GDP is the most important macroeconomic variable
- the factors of production and the production technology determine the economy's output of goods and services; an increase in 1 of the factors of production or a technological advance raises output

#### *GDP Depends on 2 Things*

##### 1. Factors of Production

- quantity of inputs to produce goods and services
- K,L
- we assume fixed amounts of labour and capital (bar on top), and that factors of production are fully utilized; nothing is wasted (real world assumptions change)

##### 2. Production Function

- ability to turn inputs into output (available production technology)
- $Y=F(K,L)$
- technological change alters the production function
- most production functions have constant returns to scale

#### 2. How is National Income Distributed to the Factors of Production

- total output of an economy equals its total income; the factors of production and production function determine national income (GDP)
- \***neoclassical theory of distribution**- commonly accepted theory today of factor markets; clashes with Marx's communist markets
- \***factor prices**- the amounts paid to the factors of production; wages and rents for capital; prices in turn determined by the supply and demand; determines the distribution of national income
- the competitive firm must determine how much labour and capital it needs; uses the same production function

**\*marginal product of labour MPL-** extra amount of output the firm gets from 1 extra unit of labour, holding capital fixed; diminishing returns usually

$$MPL = F(K, L+1) - F(K, L)$$

**\*labour demand-**  $MPL = W/P$ ; if  $P * MPL$  is greater than  $W$ , hire more labour

**\*real wage-**  $W/P$ ; the payment to labour measured in units of output rather than in dollars

**\*marginal product of capital MPK-** the amount of extra output the firm gets from an extra unit of capital, holding the amount of labour constant

$$MPK = F(K+1, L) - F(K, L)$$

**\*rental real price of capital-**  $MPK = R/P$ ; rental price measured in units of goods rather than dollars

-competitive, profit-maximizing firms hire labour until the marginal product of labour equals the real wage; similarly, these firms rent capital until the marginal product of capital equals the real rental price; therefore, each factor of production is paid its marginal product; if the production function has constant returns to scale, all output is used to compensate the inputs

-the firm demands each factor until that factor's MP falls to equal its real factor price

-real wage paid to each worker is  $MPL$  and to each owner of capital is  $MPK$ ; total real wages paid =  $MPL * L + MPK * K$

**\*economic profit-** income that remains after firms have paid the factors of production

$$EP = Y - (MPL * L) - (MPK * K)$$

**\*Euler's theorem-** states that if the production function has constant returns to scale, the economic profit is 0;  $F(K, L) = (MPK * K) + (MPL * L)$

-because the capital owners are often the owners of the firm, the return to capital represents the accounting profit

**\*accounting profit-**  $EP + (MPK * K)$

-total output is therefore divided between the payments to capital and labour, depending on their marginal productivities; the profit in the national income accounts therefore comes from the return to capital

### 3. What Determines the Demand for Goods and Services

-the economy's output is used for consumption, investment, and government purchases; consumption depends positively on disposable income, investment depends negatively on the real interest rate, and government purchases and taxes are the exogenous variables of fiscal policy

-in the closed economy, there are no exports

#### 3 Inputs for GDP

##### 1. Consumption

-2/3 of GDP

**\*disposable income-** income after the payment of taxes;  $Y - T$

**\*consumption function-**  $C = C(Y - T)$ ; states that consumption is a function of disposable income

**\*marginal propensity to consume MPC-** % change in consumption when disposable income changes by 1 dollar; slope of the consumption function

##### 2. Investment

-15% of GDP

-quantity of investment goods depends on the interest rates; when rates are low, there are many investment projects

-the real interest rate measures the true cost of borrowing, and thus determines the quantity of investment

**\*investment function-**  $I=I(r)$ ; slopes downward, because as the interest rate rises, the quantity of investment demanded falls

### 3. Government Purchases

-20% of GDP

-transfer payments are not included in G; they do affect demand for goods and services indirectly; increases in taxes are offset by transfer payments

-G can exceed or be below T; T is net of transfer payments

-G and T are exogenous variables

### 4. What Brings the Supply and Demand for Goods and Services into Equilibrium

-the real interest rate adjusts to equilibrate the supply and demand for the economy's output; or equivalently, to equilibrate the supply of loanable funds (saving) and the demand for loanable funds (investment)

-must determine the equilibrium interest rate

$$Y=C(Y-T) + I(r)+ G$$

**\*national saving**  $S= Y-C-G=I$

**\*private saving-**  $(Y-T-C)$

**\*public saving-**  $(T-G)$

-public and private saving combine to form national saving

-this means the flows into the financial markets (private and public savings) must equal the flows out of the financial markets (investment)

-investment function slopes downward; higher the interest rates, fewer investments

-the good is loanable funds and the price is the interest rates

-savings or the supply of loanable funds and investment is the demand for loanable funds

-interest rates adjust until the amount firms want to borrow equal the amount people want to save

-a decrease in national saving, perhaps because of an increase in government purchases or a decrease in taxes, reduces the equilibrium amount of investment and raises the interest rate

-government purchases crowd out investment; they borrow saved funds, thereby reducing savings and raising interest rates

-an increase in investment demand, perhaps because of a technological innovation or a tax incentive for investment, also raises the interest rate; an increase in investment demand increases the quantity of investment only if higher interest rates stimulate additional saving

**\*Cobb-Douglas production function-** incorporates these aspects of K and L

## Money and Inflation

### 1. What is Money?

-money is the stock of assets used for transactions; serves as a: store of value, unit of account, and a medium of exchange

**\*classical theory of money and inflation-** assumes that prices are flexible to determine the causes, effects, and social costs of inflation; long-run analysis uses flexible prices

**\*money-** the stock of assets that can be readily used to make transactions; roughly speaking, the dollars in the hands of the public

#### *3 Purposes of Money*

1. store of value
2. unit of account
3. medium of exchange

**\*commodity money-** use an asset with intrinsic value; gold standard has traditionally been popular

**\*fiat money-** do not use any asset with any value

-in modern economics, a central bank such as the Federal Reserve is responsible for controlling the money supply

-fiat money evolves from autarkic, bilateral barter, commodity, representative commodity, and finally to fiat money

**\*money supply-** supply of available money; controlled by the monetary policy

-the Fed primarily controls the money supply through open market operations

-C, M1, M2, M3, and L are the types of money aggregates; M1 and M2 are the most common

### 2. Quantity Theory of Money

-many equations and theories

**\*quantity equation-** link between transactions and money:  $M * V = P * T$

-money \* velocity = price \* transactions

**\*identity equation-** the definitions of the 4 variables make it true; quantity equation

-PT = number of dollars exchanged in a year

**\*transactions velocity of money-** V; measures the rate at which money circulates through the economy; number of times a dollar bill changes hands

-transactions are hard to quantify, so T is replaced with Y (total output, real GDP)

**\*income velocity of money-** Y; number of times a dollar bill enters someone's income in a given period of time

-new equation:  $M * V = P * Y$

-money \* velocity = price(GDP deflator) \* output (real GDP) (nominal GDP)

**\*real money balances-** (M/P); quantity of money in terms of the quantity of goods and services it can buy; measure the purchasing power of the stock of money

**\*money demand function-** equation showing what determines the quantity of real money balances people wish to hold



$(M/P)^d = kY$ ; where  $k$  is a constant telling us how much money people want to hold for every dollar of income; this equation states the quantity of real money balances demanded is proportional to real income

-the demand function for a particular good; the convenience of holding real money balances

-higher income leads to a greater demand for real money balances; holding more money makes it easier to spend, and if you have more you spend more

-this money demand function is another way to view the quantity equation

- $k$  and  $V$  are inversely related

$$M/P = kY$$

$$M(1/k) = PY$$

$$MV = PY; \text{ where } V = 1/k$$

-when people want to hold a lot of money for each dollar of income ( $k$  is large), money changes hands infrequently ( $V$  is small); conversely, when people want to hold only a little money ( $k$  is small), money changes hands frequently ( $V$  is large)

**\*quantity theory of money**- assumes that the velocity of money is stable and concludes that nominal GDP is proportional to the stock of money; because the factors of production and the production function determine real GDP, the quantity theory implies that the price level is proportional to the quantity of money; therefore, the rate of growth in the quantity of money determines the inflation rate

-assumes constant velocity; not entirely true

### ***3 Building Blocks of Economic Price Formation***

1. factors of production and the production function determine output  $Y$

2. money supply determines nominal value of output  $PY$ ; this conclusion follows from the quantity equation and the assumption that the velocity of money is fixed

3. the price level  $P$  is the ratio of the nominal value of output  $PY$  to the level of output  $Y$

-this implies that since velocity is fixed, and the factors of production and the production function have already determined the real GDP, the change in nominal GDP is due to changes in prices; GDP deflator or inflation

-this implies that the central bank can control inflation with the money supply

-this theory states that increases in the money supply coincide with inflation

### **3. Seigniorage: Revenue from Printing Money**

-3 ways to make money: taxes, borrowing, or printing

**\*seigniorage**- revenue government raises by printing money; it is a tax on money holding

-is quantitatively small in most economies, it is often a major source of government revenue in economies experiencing hyperinflation

-inflation tax results from printing money

-seignur is French for fuedal lord; lord had the exclusive right to coin money

-in the US only 3%; in other countries can be much higher

### **4. Inflation and Interest Rates**

-nominal interest rate is the sum of the real interest rate and inflation rate

$$r = i - \dot{A}$$

**\*Fisher effect**- the nominal interest rate moves 1 for 1 with expected inflation; shows 2 things, the nominal interest rate can change either because of the real interest rate or the inflation rate; equates the quantity theory or money and Fisher equation; 1% increase in money growth causes a 1% increase in inflation (quantity theory) which causes a 1% increase in nominal interest rate (Fisher equation)

$$-i = r + \dot{A}$$

-inflation rates and nominal interest rates thus follow each other

**\*ex ante interest rate**- interest rate borrower and lender expect when loan is made

**\*ex post interest rate**- interest rate actually realized

-ex ante reflects expected inflation, which is what comprises the nominal interest rate; it is impossible to know the actual inflation rate in advance

$$-i = r + \dot{A}^e$$

-the Fisher Effect did not hold in the 19<sup>th</sup> century, because inflation caught merchants napping; the expected inflation rate is what is important, and so if no inflation is expected then the nominal interest rate will not be accompanied by high inflation

## 5. Nominal Interest Rate and Demand for Money

-the quantity theory is based on a simple money demand function: it assumes that the demand for real money balances is proportional to income; we must add in the nominal interest rate for the full story

-the nominal interest rate is the opportunity cost of holding money; thus one may expect the demand for money to depend on the nominal interest rate; if it does, then the price level depends on both the current quantity of money and the quantities of money expected in the future

-the quantity of money demanded depends on the price of holding money, just like any other good; hence, the demand for real money balances depends on both the level of income and the nominal interest rate

$$(M/P)^d = L(i, Y)$$

-states that the demand for the liquidity of real money balances (L) is a function of income and the interest rate; when income rises, the greater the demand for real money balances; when nominal interest rates rise, the lower the demand for real money balances ( $M/P = L(r + \dot{A}^e, Y)$ )

-this states that the price level depends not only on the today's money supply but also on the money supply expected in the future; ie expected inflation

## 6. Social Costs of Inflation

-increases in prices is what allows wages to increase as well

***Costs of expected inflation include***

1. shoeleather costs
2. menu costs
3. cost of relative price variability RPV- firms change menu prices less often
4. tax distortions- tax laws do not account for inflation
5. inconvenience of making inflation corrections

-unexpected inflation causes arbitrary redistributions of wealth between debtors and creditors; can be seen clearly with long-term bond prices; hurts people on fixed pensions

-this induces people to write contracts in real terms and not nominal; but in countries with moderate inflation like the US this is not a problem

-high inflation is variable inflation

-1 possible benefit of inflation is that it improves the functioning of labour markets by allowing real wages to reach equilibrium levels without cuts in nominal wages

### **7. Hyperinflation**

-inflation exceeding 50% a month, or 1% a day

-during hyperinflations, most of the costs of inflation become severe; hyperinflation typically begins when governments finance large budget deficits by printing money; they end when fiscal reforms eliminate the need for seigniorage

### **8. Classical Dichotomy**

\***classical dichotomy**- refers to the theoretical separation of real and nominal variables; allows us to examine real variables while ignoring nominal variables; arises because, in classical dichotomy economic theory, changes in the money supply do not affect real variables

\***monetary neutrality**- according to classical economic theory, money is neutral; the money supply does not affect real variables; usually correct

\***real variables**- all variables measured in physical units, such as quantities and relative prices

\***nominal variables**- variables expressed in terms of money; price level, inflation rate, dollar wages

-therefore, classical theory allows us to study how real variables are determined without any reference to the money supply; the equilibrium in the money market then determines the price level, and as a result, all other nominal variables

\***Cagan model**- develops more explicitly how if the quantity of real money balances demanded depends on the cost of holding money, the price level depends on both the current money supply and the future money supply

## The Open Economy

### 1. International Flows of Capital and Goods

-everyone participates in international trade

-a key difference between closed and open economies is that open economies need not equate spending with output of goods and services; country can spend more or less

$$Y = C^d + I^d + G^d + EX$$

$$C = C^d + C^f$$

$$I = I^d + I^f$$

$$G = G^d + G^f$$

**\*net exports, trade balance-** the difference between exports EX and imports IM; they are equal to the difference between what we produce and what we demand for consumption, investment, and government purchases; output – domestic spending

$$S = Y - C - G$$

$$S = I + NX$$

$$NX = S - I$$

**\*net capital outflow, net foreign investment; S – I:** is the excess of domestic saving S over domestic investment I; the trade balance is the amount received for net exports of goods and services; the national income accounts identity shows that the net capital outflow always equals the trade balance

-leads to a trade surplus, trade deficit, or a trade balance; trade deficits, foreigners either buy government debt or invest in domestic assets (stocks, real estate)

### 2. Saving and Investment in an Open Economy

-in a closed economy, the real interest rate will equilibrate savings and investment; in the open economy, the world interest rate is what determines the domestic real interest rate; it is exogenously given as fixed

$Y = Y = F(K, L)$ ; Y is fixed by the factors of production and the production function

$C = C(Y - T)$ ; C is positively related to disposable income Y - T

$I = I(r)$ ; I is negatively related to (r)

-NX, the trade balance, is determined by the difference between S and I at the world interest rate

-I depends on the world interest rate; high interest rates make some projects unprofitable

-S depends on fiscal policy; lower G or higher T raise national S

- the impact of any policy on the trade balance can be determined by examining its impact on saving and investment; policies that raise saving or lower investment lead to a trade surplus, and policies that lower saving or raise investment lead to a trade deficit
- starting from balanced trade, a change in fiscal policy that reduces national S (increase in G or decrease in T) leads to a trade deficit
- an increase in the world interest rate due to a fiscal expansion abroad leads to a trade surplus; government purchases from abroad reduce world S and increase world interest rate
- an outward shift in the demand schedule causes a trade deficit
- the flow of goods and services measured by the trade balance is inextricably linked to the international flow of funds for capital accumulation; thus, the impact of economic policies on the trade balance can always be found by examining their impact on domestic S and I
- \***positive analysis**- not indicate whether such policy is desirable
- \***normative analysis**- indicates whether such policies are desirable
- trade deficit does not mean bad performance, depends on the place in the country life cycle

### 3. Exchange Rates

- the exchange rate is the price at which countries trade with other to incur deficits or surpluses
- \***nominal exchange rate**- rate at which people trade the currency of 1 country for the currency of another
- \***real exchange rate, terms of trade**- rate at which people trade the goods produced by the 2 countries
- the real exchange rate equals the nominal exchange rate \*  $(P_D/P_F)$
- if the real exchange rate is high, foreign goods are relatively cheap, and domestic goods are relatively expensive; if the real exchange rate is low, foreign goods are relatively expensive, and domestic goods are relatively cheap
- because the real exchange rate is the price of domestic goods relative to foreign goods, an appreciation of the real exchange rate tends to reduce net exports; the equilibrium exchange rate is the rate at which the quantity of net exports demanded equals the net capital outflow
- the nominal exchange rate is determined by the real exchange rate and the price levels in the 2 countries; other things equal, a high inflation rate leads to a depreciating currency

### 2 Assumptions

1. real exchange rate related to net exports
  2. NX, trade balance, must equal net capital outflow, which = S-I
- S is fixed by the consumption function and fiscal policy; I is fixed by the investment function and world interest rates
  - at the equilibrium real exchange rate, the supply of dollars available from the net capital outflow balances the demand for dollars by foreigners buying our net exports
  - when government reduces national S by increasing G or decreasing T, the dollar appreciates and the NX decreases (more imports, less exports); this causes the real exchange rate to rise

- when foreign governments increase G or decrease T, the dollar depreciates and the NX increases (less imports, more exports); this causes the real exchange rate to fall
- when I rises in the US, the real exchange rises, as the dollar appreciates because more people want to invest in the US
- protectionist trade policies do not alter the trade deficit; the dollar appreciates as domestic products become more attractive, thus reducing exports as well as imports; they benefit certain groups, but not international trade as a whole
- the % change in nominal exchange rate = % change in real exchange rate + difference in inflation rates (price levels)
- high domestic inflation lowers the nominal exchange rate for the home country
- \*purchasing power parity**- if international arbitrage is possible, then every dollar must have the same purchasing power in every country
- essentially, purchasing power should reduce differences in the real exchange rate

## **2 Implications**

1. because NX schedule is flat, changes in S or I do not influence real or nominal exchange rates
2. because the real exchange rate is fixed, all changes in the nominal exchange rate result from changes in price levels

## **2 Issues**

1. some goods are not easily traded- haircuts
2. preferences- real exchange rates do vary because of this

## **4. US as a Large Open Economy**

- small open economy means interest rate (r) is fixed by the world economy
- small closed economy the domestic interest rate (r) equilibrates domestic S and domestic I, implying that policies that influence S or I influence the equilibrium interest rate

## **2 Issues with US**

1. US is large- they can influence world interest rates
  2. capital mobility across countries is not perfect; people prefer to hold their own currency
- must combine closed economy and small economy logic for a large country
  - large and small economies are essentially the same for models however; the only difference is that policies affect the interest rate in a large open economy
  - in both large and small open economies: increase in S or decrease in I leads to trade surplus; decrease in S or increase in I leads to trade deficit
  - in both economies, protectionist trade policies cause the exchange rate to appreciate and do not influence the trade balance

## Unemployment

### 1. Job Loss, Job Finding, and the Natural Rate of Unemployment

- unemployment is the macroeconomic problem that affects people most directly and severely; job loss means reduced living standard and psychological distress
- public policies can help people find work or pay them when they aren't working; some like minimum wage lower unemployment as a whole
- many models make the assumption that the economy is always at full employment; not the case
- unemployment rate averages 5-6% yearly
- \***natural rate of unemployment**- steady-state rate of unemployment; average rate of unemployment around which the economy fluctuates
- depends on rate of job separation and rate of job finding; any policy aimed at lowering the natural rate of unemployment must either reduce the rate of job separation or increase the rate of job finding; similarly, any policy that affects the rate of job separation or job finding also changes the natural rate of unemployment

$$L = E + U$$

-unemployment therefore =  $U/L$

\***job separation**- ( $s$ ); fraction of employed individuals who lose their job each month

\***job finding**- ( $f$ ); fraction of unemployed individuals who find a job each month

$$fU = sE$$

-steady state, when # of people finding jobs is equal to # of people losing jobs

$$fU = s(L - U)$$

-combining equations

$$U/L = s/(s+f)$$

-unemployment rate

### 2 Causes of Unemployment

1. job search
2. wage rigidity

### 2. Job Search and Frictional Unemployment

- because it takes time for workers to search for the job that best suits their individual skills and tastes, some frictional unemployment is inevitable; various government policies, such as unemployment insurance, alter the amount of frictional unemployment
- \***frictional unemployment**- unemployment caused by time it takes workers to search for a job; different jobs have different skills and different wages in different regions
- \***sectoral shift**- a change in the composition of demand among industries or regions

#### *Causes of Job Separation and Frictional Unemployment*

1. sectoral shifts

2. failing firms
3. bad performance
4. skills become outdated
5. moving

**\*unemployment insurance**- can be argued it raises or lowers unemployment; main issue here is that the unemployed now become less motivated to look for new jobs  
 -may not be bad: reduces uncertainty (psychological distress) and helps workers to turn down unattractive job offers for the overall good of the society  
 -1 suggestion is to make firms 100% experience rated, which means they would have to pay 100% of unemployment benefits; this would reduce temporary layoffs; currently the system is partially experience rated

### **3. Real-Wage Rigidity and Structural Unemployment**

-structural unemployment results when the real wage remains above the level that equilibrates labour supply and labour demand

**\*wage rigidity**- failure of wages to adjust until labour supply equals labour demand  
 -occurs when the real wage is stuck above market-clearing level; firms must ration scarce jobs among workers; reduces job finding

**\*structural unemployment**- unemployment resulting from wage rigidity and job rationing

-waiting for jobs to become available; supply of labour exceeds demand

#### **Causes of Wage Rigidity**

1. minimum-wage legislation
2. unions
3. threat of unionisation
4. efficiency wage theory

-minimum wage is mainly bad for teenagers; they get a lot of compensation from apprenticeships, and they have a low MPL; it lifts some people out of poverty, while preventing some teenagers from finding jobs; earned income tax credit and others are ways for poor families to still get enough money

-unions lead to fewer hires and more structural unemployment since their wages are determined by collective bargaining; the threat can cause similar reactions; insiders (have jobs) and outsiders (need jobs) plays heavily in union talks; a lot depends on who is included in negotiations, when the government helps usually is better for outsiders

**\*efficiency wage theories**- suggest that, for various reasons, firms may find it profitable to keep wages high despite an excess supply of labour; firm operates more efficiently, thus leading to lower job finding and greater unemployment

-types of: can afford more nutritious diets and so forth (not useful in developed countries); reduces labour turnover; adverse selection (better quality workforce); high wages make workers more productive

### **4. Patterns of Unemployment**

-whether we conclude that most unemployment is short term or long term depends on how we look at the data; most spells of unemployment are short, yet most weeks of unemployment are attributable to the small number of long-term unemployed



-the unemployment rates among demographic groups vary substantially; in particular, the unemployment rates for younger workers are much higher than for old workers; this results from a difference in the rate of job separation rather than from a difference in the rate of job finding

-the natural rate of unemployment in the US has exhibited long-term trends; in particular, it rose from 1950s to 1970s and then started drifting downward again in the 1990s; various explanations have been proposed, including the changing demographic composition of the labour force, changes in the prevalence of sectoral shifts, and changes in the rate of productivity growth

-individuals who have recently entered the labour force, including both new entrants and reentrants, make up about 1/3 of the unemployed; transitions into and out of the labour force make unemployment statistics more difficult to interpret

**\*discouraged workers-** given up looking for jobs after not being able to find one

-unemployment rates have been rising in Europe; more generous benefits, lower demand for unskilled workers

## **5. Conclusion**

-unemployment represents wasted resources; these workers have the potential to contribute to national income, but are not doing so

-neither frictional or structural unemployment can be easily reduced; government cannot make job search instantaneous, and it can't easily bring wages closer to equilibrium levels; 0 unemployment is not a plausible goal for free-market economies

-the policies chosen can have great effects on the economy's natural rate of unemployment

# III. Growth Theory: The Economy in the Very Long Run

## Economic Growth I

### 1. Accumulation of Capital

- material standards of living increase over time in most countries; due to rising incomes
- differences in GDP depend on: L, K, and technology

### 3 Influences of GDP

1. labour
2. capital
3. technology

\***Solow Growth model**- designed to show how growth in the capital stock, labour force, and advances in technology interact in an economy

-the Solow Growth Model shows that in the long run, an economy's rate of S determines the size of its capital stock and thus its level of production; the higher the rate of S, the higher the stock of capital and the higher the level of output

-dynamic model, shows changes over time

### 3 Steps to Solow

1. supply and demand for goods determines accumulation of capital
2. introduce labour forces
3. introduce technology

### 2 Main Parts of Solow

#### 1. production function- supply for goods

$$Y=F(K,L)$$

$$Y/L=F(K/L,1)$$

-assumes constant returns to scale

$$y=f(k); y=Y/L; k=K/L$$

-output per worker and capital per worker

$$MPK=f'(k+1)-f'(k)$$

-lower units of (k) mean there is little K to work with and MPK is higher

#### 2. consumption function- demand for goods

$$y=c + i$$

$$c=(1-s)y$$

$$y=(1-s)y + i$$

$$i=sy$$

-per worker versions

-so, for any given capital stock ( $k$ ), the production function  $y=f(k)$  determines how much output the economy produces, and the saving rate ( $s$ ) determines the allocation of that output between  $C$  and  $I$

## **2 Influences of Capital Stock**

1. investment

2. depreciation

-at any moment, the capital stock is a key determinant of the economy's output, but the capital stock can change over time; the higher the capital stock, the greater the amounts of output and investment, but the higher the capital stock, the greater also the amount of depreciation

-investment and depreciation should balance themselves relatively

**\*steady-state**- capital stock and output are steady over time; not growing or shrinking; represents the long-run equilibrium; economy at steady state will stay there, and not there will go there

-in the Solow Model, an increase in the rate of  $S$  causes a period of rapid growth, but eventually that growth slows as the new steady state is reached; thus, although a high  $S$  rate yields a high steady-state level of output,  $S$  by itself cannot generate persistent economic growth

- $S$  rate is a key determinant of the steady state level of capital; when  $S$  is high, the economy will have a large capital stock and a high level of output—when the  $S$  rate is low, the economy will have a small capital stock and a low level of output

-greater  $S$  leads to more money for  $I$ ; will not lead to a higher rate of growth forever, eventually will lead to steady state and no more excessive growth

-high  $S$  and  $I$  can lead to greater income and GDP and standard of living

## **2. Golden Rule Level of Capital**

-the level of capital that maximises steady-state  $C$  is called the Golden Rule level; if an economy has more  $K$  than in the Golden Rule steady state, then reducing  $S$  will increase  $C$  at all points in time; by contrast, if the economy has less  $K$  than in the Golden Rule steady state, then reaching the Golden Rule requires increased investment and thus lower  $C$  for current generations

-essentially, don't need a 100%  $S$  rate

**\*Golden Rule level of capital**- steady state value of ( $k$ ) that maximises  $C$

-if policy makers could set the  $S$  rate, more consistent economic output could be achieved

-steady state  $C$  is what's left of steady state  $Y$  after paying for steady state depreciation

2 opposite effects of more capital—more capital means more output, but more capital also means more output is needed to replace capital that is wearing out

-steady state output and depreciation are a function of steady state capital stock

-at the Golden Rule of Capital, the  $MPK =$  depreciation rate

-need not to automatically tend to the steady state; must set the  $S$  rate accordingly

## **2 Ways to Get Steady State**

1. steady-state  $C$

2.  $MPK$ - easier method to use

-if the economy has too much or too little capital, will have to adjust  $S$  rates down or up accordingly

-when the economy begins above the Golden Rule, reaching the Golden Rule produces higher  $C$  at all points in time; when the economy begins below the Golden Rule, reaching the Golden Rule requires initially reducing  $C$  to increase  $C$  in the future

-thus, optimal capital accumulation can depend on how crucially we weigh the interests of current and future generations; tradeoff between welfare for different generations

### **3. Population Growth**

-S rate and capital accumulation cannot by itself explain sustained economic growth; population growth and technology must be incorporated into the model

-the Solow Model shows that an economy's rate of population growth is another long-run determinant of the standard of living; the higher the rate of population growth, the lower the level of output per worker

-equations

#### ***3 Effects of Population Growth***

1. can't explain sustained growth in standard of living (technology) , but can explain sustained growth in GDP

2. higher population growth has lower levels of GDP

3. affects derivation of steady state rate of capital

- $MPK - \text{depreciation} = \text{population growth}$

## Economic Growth II

### 1. Technology Progress in Solow Model

-3 influences to growth: capital, labour force, technology

-in the steady state of the Solow growth model, the growth rate of income per person is determined solely by the exogenous rate of technological progress

$$Y = F(K, L * E)$$

**\*efficiency of labour E-** reflects society's knowledge about production methods; as the available technology improves, the efficiency of labour rises; rises when technology changes, and when improvements arise in health, education, or the skills of the labour force

-L \* E measures # of effective workers; considers workers and efficiency of each workers

**\*labour-augmenting technological progress g-** technological progress assumes that the efficiency of labour E grows by some constant rate of g

-if g equals .02, then each unit of labour becomes 2% more effective each year; output increases as if the labour force had increased by an additional 2% each year

-the labour force L is growing at rate n and the efficiency of each unit of labour is growing at rate g, the # of effective workers (L+E) is growing at rate (n+g)

-in the Solow growth model with population growth and technological progress, the Golden Rule (consumption-maximising) steady state is characterised by equality between the net MPK ( $MPK - \delta$ ) and steady state growth rate (n+g); by contrast, in the US economy, the net MPK is well in excess of the growth rate, indicating that the US economy has much less K than in the Golden Rule steady state

#### **4 Important Variables**

1. capital per effective worker
2. output per effective worker
3. output per worker
4. total output

-according to the Solow model, only technological progress can explain persistently high living standards

### 2. Policies to Promote Growth

-policymakers in the US and other countries often claim that their nations should devote a larger % of their output to S and I; increased public S and tax incentives for private S are 2 ways to encourage capital accumulation

-the capital stock in the US is well below the Golden Rule steady state; if we saved more for investment, we would grow better and eventually reach a steady state consumption level

-higher national saving means higher public saving, higher private saving, or some combination of the 2; some combination of the 2 is needed

-most direct way is through public saving- the difference between budget surplus and deficit

-taxes generally discourage saving because they reduce the rate of return earned on private savings and investments; tax exempt retirement accounts help as well

-different kinds of capital the economy needs: human (physical) capital, infrastructure; policy makers must decide which types of capital they want to grow, and ensure a level playing field for the different types of capital with equal taxes- then rely on the market to allocate them efficiently

-some argue that the government should actively encourage different forms of capital, for example, by encouraging technological externalities from learning by doing (industrial policy)

-this requires the government be able to measure the externalities of different economic activities so it can give correct incentive to each action

### ***2 Issues with Industrial Policies***

1. measuring externalities from various industries is virtually impossible

2. political process is far from perfect; this process involves awarding subsidies and tax breaks for certain industries

-measuring the benefits of public capital is much more difficult than measuring private capital returns

-many government policies and organisations encourage patents and technological progress

### ***4 Reasons for Fall in Productivity Growth***

1. measurement problems

2. oil prices

3. worker quality

4. depletion of ideas

-technology can slow down and increase on its own at times; old adage that the illness goes away without the doctor doing anything

### **3. Growth Theory to Growth Empirics**

-in the early 1970s, the rate of growth fell substantially in most industrialised countries; the cause of this slowdown is not well documented; in the mid 1990s, the rate of growth increased, most likely because of advances in information technology

#### ***2 Aspects of Solow Model***

-we usually only see convergence within a country; in the US 2% convergence between states; real wages have increased about 2% per year as well (balanced growth)

**1. balanced growth-** according to the Solow model, technological progress causes the values of many variables to rise together in the steady state

-Marx predicted that the return to capital would decline over time and this would lead to political and economic crisis; economic history has not supported this, which is why we follow the Solow model and not Marx's

**2. convergence-** poorer countries catching up to richer countries

-convergence depends on why they differed in the first place; if 2 economies with the same steady state happened by historical accident to start off with different capital stocks, then we expect them to converge; but if 2 economies have different steady states, perhaps

because of different levels of saving v. investment, then we will not expect convergence and each economy will approach its own steady state

**\*conditional convergence**- different countries have different steady-states; countries of the world experience this, where they converge to their own steady-states, which are in turn determined by savings, population growth, and education

### ***2 Causes of International Differences in Output***

1. factor accumulation

-differences in quantities of human and physical capital

2. production efficiency

-some workers are more efficient with their tools

-issue is which of these explains a nation's low productivity; usually they go along with each other however

-another possibility is that these 2 things are driven by government policies

-many empirical studies have examined to what extent the Solow model can help explain long-run economic growth; the model can help explain much of what we see in the data, such as balanced growth and conditional convergence; recent studies have also found that international variation in standards of living is attributable to a combination of capital accumulation and the efficiency with which capital is used

### **4. Beyond the Solow Growth Model: Endogenous Growth Theory**

-explains the technological progress that the Solow model takes as exogenous; need something to explain where the technological progress came from

-modern theories of endogenous growth theory attempt to explain the rate of technological progress, which the Solow model takes as exogenous; these models try to explain the decisions that determine the creation of knowledge through research and development

-treats knowledge as a type of capital; thus, you have physical capital and intellectual capital in the equation; the economy exhibits constant, not diminishing, returns to scale

### ***3 Facts About R&D***

1. knowledge is largely a public good

2. research is profitable because innovations give firms temporary monopolies

3. when 1 firm innovates, others build on it for the future

-can lead to positive "standing on shoulders" externality or negative "stepping on toes" externality

-most studies agree that the gains from R&D outweigh stepping on the toes; some estimate returns on R&D are 40% per year, much better than 8% return on physical capital

-long-run economic growth is the single most important determinant of the economic-well being of a nation's citizens—everything else, unemployment, trade deficits, inflation, and so on pales in comparison

-the Solow model shows how saving, population growth, and technological progress all affect long-term growth and determine the nation's standard of living

### **5. Growth Accounting**

-this breakdown provides us with a measure of the rate of technological change

### ***3 Sources of Growth***

1. increases in capital
  2. increases in labour
  3. advances in technology
- technological progress changes the production function over time
  - \***total factor productivity**- current level of technology; captures anything that changes the relation between measured inputs and outputs
  - measured indirectly, after getting the output growth, and then subtracting capital and labour from the value
  - total factor productivity can change for many reasons: efficient production methods, education, government regulation
  - US has averaged about 1% in each area



# IV. Business Cycle Theory: The Economy in the Short Run

## Introduction to Economic Fluctuations

### 1. Time Horizons in Macroeconomics

-economic fluctuations present a recurring problem for economists and policy makers

\***business cycle**- short-run fluctuations around output and employment

-the crucial difference between the long run and the short run is that prices are flexible in the long run but sticky in the short run; the model of aggregate supply and aggregate demand provides a framework to analyse economic fluctuations and see how the impact of policies varies over different time horizons

-different models are needed for different time periods

-the failure of prices to adjust quickly and completely in the short run means that output and employment must do some of the adjusting instead; during the time period where prices are sticky, the classical dichotomy no longer holds: nominal variables can influence real variables, and the economy can deviate from the equilibrium predicted by the classical model

-in classical theory, the amount of output depends on the economy's ability to supply goods and services, which in turn depends on the supplies of capital and labour and on the available production technology (Solow model); flexible prices are a critical assumption of this theory, as it posits (sometimes implicitly), that prices adjust to ensure that the quantity of output demanded equals the quantity supplied

-when prices are sticky, output also depends on the demand for goods and services; demand, in turn, is influenced by monetary policy, fiscal policy, and other factors; because monetary and fiscal policy can influence the economy's output over the time horizon when prices are sticky, price stickiness provides a rationale for why these policies may be useful in stabilising the economy in the short run

-therefore, the supply and the demand for goods determines prices and quantity sold; shifts in supply and demand will thus affect the P and Q

-the economy-wide model of AS and AD aggregates price levels and output and gives us a way to contrast how the economy behaves in the long run and how it behaves in the short run

## 2. Aggregate Demand

-the aggregate demand curve slopes downwards; it tells us that the lower the price level, the greater the aggregate quantity of goods and services demanded

\*AD- relationship between the quantity of output demanded and the aggregate price level

$$MV=PY$$

-if the velocity of money is constant, then this equation states that the money supply determines the nominal value of output, which in turn is the product of the price level and the amount of output

$$M/P=(M/P)^D =kY$$

-where  $k=1/V$  is a parameter determining how much money people want to hold for every dollar of income

-in this form, the quantity equation states that the supply of real money balances  $M/P$  equals the demand  $(M/P)^D$  and that the demand is proportional to output  $Y$ ; the velocity of money  $V$  is the flipside of the money demand parameter  $k$

-for any fixed money supply and velocity, the quantity equation yields a negative relationship between the price level  $P$  and output  $Y$ ; this downward sloping curve is the demand curve

-the quantity equation explains the downward slope of the aggregate demand curve very simply; money supply  $M$  and velocity  $V$  determine the nominal value of output  $PY$ ; once  $PY$  is fixed, if  $P$  goes up,  $Y$  must go down

-in economics terms, because we have assumed the  $V$  of money is fixed, the money supply determines the dollar value of all transactions in the economy; if the price level rises, each transaction requires more dollars, so the number of transactions and thus the quantity of goods and services purchased must fall

-the AD curve shows the relationship between the price level  $P$  and quantity of goods and services demanded  $Y$ , drawn for a given supply of money  $M$ ; the aggregate demand curve slopes downward, the higher the price level  $P$ , the lower the level of real balances  $M/P$ , and therefore the lower the quantity of goods and services demanded  $Y$

-if output is higher, people engage in more transactions and need higher real balances  $M/P$ ; for a fixed money supply  $M$ , higher real balances imply a lower price level; conversely, if the price level is lower, real money balances are higher—the higher level of real balances allows a greater volume of transactions, which means a greater quantity of output is demanded

-the aggregate demand curve is drawn for a fixed value of the money supply; it tells us the possible combinations of  $P$  and  $Y$  for a given value of  $M$ ; if the Fed changes the money supply, then the possible combinations of  $P$  and  $Y$  change, which means the aggregate demand curve shifts

-if the money supply reduces, the demand curve shifts to the left inward; if the money supply increases, the demand curve shifts to the right outward

-fluctuations in the money supply are not the only source of fluctuations in aggregate demand; even if the money supply is held constant, the aggregate demand curve shifts if some event causes a change in the  $V$  of money

### 3. Aggregate Supply

-the aggregate supply curve is another relationship curve between P and Y that gives us the whole story when combined with aggregate demand curve

\*AS- relationship between the quantity of goods and services supplied and the price level

#### 2 Different AS Curves

-because the firms that supply goods and services have flexible prices in the long run and sticky prices in the short run, there are 2 curves

##### 1. long run- LRAS

-the aggregate supply curve is vertical because output is determined by the amounts of capital and labour and by the available technology, but not by the level of prices; therefore, shifts in aggregate demand affect the price level but not output or employment  
-satisfies the classical model, because it implies that the level of output Y is independent of the money supply; this long run level of output is the full or natural employment level

##### 2. short run- SRAS

-the aggregate supply curve is horizontal, because wages and prices are sticky at predetermined levels; therefore, shifts in aggregate demand affect output and employment but not price levels

-a recession results from less demand because prices cannot adjust

-over long periods of time, prices are flexible, the aggregate supply curve is vertical, and changes in aggregate demand affect the price level but not output; over short periods of time, prices are sticky, the aggregate supply curve is flat, and changes in aggregate demand do affect the economy's output of goods and services

-a shift in aggregate demand affects output in the short run, but this effect dissipates in over time as firms adjust their prices

### 4. Stabilisation Policy

-shocks to aggregate demand and aggregate supply cause economic fluctuations; because the Fed can shift the aggregate demand curve, it can attempt to offset these shocks to maintain output and employment at their natural rates

\*shocks- exogenous changes in the AS and AD curves

\*demand shocks- shock that shifts the aggregate demand curve

\*supply shocks- shock that shifts the aggregate supply curve

-these shocks disrupt economic well-being by pushing output and employment away from their natural rates

\*stabilisation policy- policy actions aimed at reducing the severity of short-run economic fluctuations; because output and employment fluctuate around their long-term natural rates, stabilisation policy dampens the business cycle by keeping output and employment as close to their natural rates as possible

-how the monetary policy responds to shocks is an important component of stabilisation policy because the money supply has a powerful impact on aggregate demand

#### 2 Shocks

##### 1. AD

-introduction and expanded availability of credit cards; reduce quantity of money people hold; reduction in money demand is equivalent to an increase in the velocity of money

- when each person holds less money, the money demand parameter  $k$  falls; each dollar of money moves from hand to hand more quickly,  $V$  ( $1/k$ ) rises
- if the  $M$  is held constant, the increase in  $V$  causes nominal spending to rise and AD curve to shift outward
- an increase in AD due to an increase in the  $V$  of money, raises  $Y$  above its natural rate; as prices rise, output gradually returns to its natural rate, with the economy having grown; reducing the money supply will offset the increase in  $V$
- this growth will have to result in a collapse as no wealth was created

## 2. AS

- supply shocks alter the prices of inputs and thus the prices of goods
- sometimes called price shocks because they have a direct impact on the price level
- can be favourable or adverse supply shocks
- \***stagflation**- rises prices (inflation) and falling output
- 2 options for dealing with adverse supply shock- hold aggregate demand constant and let prices fall eventually but the cost is a painful recession; or expand aggregate demand to raise prices permanently while avoiding the recession (accommodating the shock)

## Aggregate Demand I

### 1. Goods Market and the IS Curve

-a new classical model was needed after the Great Depression; according to that theory, the factors supplies and available technology which determine NI did not change from 1929-1933

-Keynes proposed a new General Theory; he said low aggregate demand is responsible for the low income and high employment that characterise economic downturns—before classical theory proposed that aggregate supply alone (capital, labour, and technology) determines NI; in the long run prices are flexible and AS determines income—in the short run prices are sticky and AD determines income

?which variables shift the AD curve causing fluctuations in NI, and policymakers have different tools to influence AD?

-the IS-LM model shows what determines NI for any give price level; shows how interactions between these markets determine the position and slope of the AD curve, and therefore NI in the short run

### 2 Views

1. IS-LM shows income to change in the short run when the price level is fixed

2. IS-LM shows what causes the AD curve to shift

IS= Investment and Savings- what's happening in the market for goods and services

LM=Liquidity and Money- what's happening to the supply and demand for money

-as the interest rate influences both investment and money demand, it is the variable that links the 2 halves of the IS-LM

\***Keynesian cross**- is a basic model of income determination; it takes fiscal policy and planned investment as exogenous and then shows that there is 1 level of NI at which actual expenditure equals planned expenditure; it shows that changes in fiscal policy have a multiplied impact in income

-simplest interpretation of Keynes's Theory of NI and is a building block for more complex and realistic IS-LM model

-Keynes proposed that spending determined the economy's total income in the short run, and thus low spending was the cause for recessions and depressions

### 2 Functions to Keynesian Cross

#### 1. planned-expenditure function

-the difference between actual and planned expenditure; line slopes upwards as higher income leads to higher C and higher planned expenditure; MPC rises and is the slope of the planned-expenditure function

$$E=C(Y-T) + I + G$$

#### 2. general equilibrium function

-economy is in equilibrium and actual=planned expenditure

$$Y=E$$

-inventories play an important role in the adjustment process; when inventories are not equal production changes and then does total income and expenditure

-the Keynesian cross shows how income  $Y$  is determined for given planned levels of investment  $I$  and fiscal policy  $G$  and  $T$ ; this model shows how income changes when one of these exogenous variables change

**\*government purchases multiplier**- tells us how much income rises from a \$1 increase in government purchases, as  $G$  is a component of  $E$ ; an increase in government purchases causes a greater increase in income

(infinite geometric series)-  $\Delta Y/\Delta G = 1/(1-MPC)$

-Keynesian cross says the government-purchases multiplier is greater than 1

-fiscal policy has a multiplied effect on  $I$ , because as higher  $I$  leads to higher  $C$ , higher  $G$  raises  $I$  increasing  $C$  as well and so on;  $C=C(Y-T)$

**\*tax multiplier**- amount income changes in response to a \$1 decrease in taxes;

$\Delta Y/\Delta T = -MPC/(1-MPC)$

-tax cuts stimulate AS by improving workers' incentives and expand AD by raising households' DI

-once we allow planned investment to depend on the interest rate, the Keynesian cross yields a relationship between the interest rate and NI; a higher interest rate lowers planned investment, and this in turn lowers NI; the downward-sloping IS curve summarises this negative relationship between the interest rate and income

-an increase in income raises  $S$  and thus lowers the interest rate that equilibrates the supply and demand for loanable funds

-the IS curve shows the combinations of the interest rate and the level of income that are consistent with equilibrium in the market for goods and services; the IS curve is drawn for a given fiscal policy; changes in fiscal policy that raise the demand for goods and services shift the IS curve to the right—changes in fiscal policy that reduce the demand for goods and services shift the IS curve to the left

-the IS curve does not determine either income  $Y$  or interest rate ( $r$ ); instead, the IS curve is a relationship between  $Y$  and ( $r$ ) arising in the market for goods and services, or equivalently, the market for loanable funds—the LM curve is needed to determine the equilibrium in the economy

## 2. Money Market and the LM Curve

-the LM curve plots the relationship between the interest rate and the level of income that arises in the market for money balances

**\*theory of liquidity preference**- basic model of the determination of the interest rate; it takes the money supply and the price level as exogenous and assumes that the interest rate adjusts to equilibrate the supply and demand for real money balances; the theory implies that increases in the money supply lower the interest rate

-just as the Keynesian cross is the building block for the IS curve, the theory of liquidity preference is the building block for the LM curve

$(M/P)^D = L(r, Y)$

-the supply and demand for real money balances determine the interest rate; the supply curve for real money balances is vertical because the supply does not depend on the interest rate; the demand curve is downward sloping because a higher interest rate raises

the cost of holding money and thus lowers the quantity demanded—at the equilibrium interest rate, the quantity of real money balances demanded equals the quantity supplied  
 -the LM curve shows the combinations of the interest rate and the level of income that are consistent with equilibrium in the market for real money balances; the LM curve is drawn for a given supply of real money balances—decreases in the supply of real money balances shift the LM curve upward; increases in the supply of real money balances shift the LM curve downward

-once we allow the demand for real money balances to depend on NI, the theory of liquidity preference yields a relationship between income and the interest rate; a higher level of income raises the demand for real money balances, and this in turn raises the interest rate; the upward sloping LM curve summarises this positive relationship between income and the interest rate

-the LM curve by itself does not determine either income  $Y$  or the interest rate ( $r$ ) that will prevail in the economy; like the IS curve, the LM curve is only a relationship between these 2 endogenous variables; the IS and LM curves together determine the economy's equilibrium

### 3. Short-Run Equilibrium

-the intersection of the IS and LM curves represents simultaneous equilibrium in the market for goods and services and in the market for real money balances for given values of government spending, taxes, the money supply, and the price level; actual expenditure equals planned expenditure and the interest rate and the income satisfy equilibrium conditions

-the IS-LM model combines elements of the Keynesian cross and the elements of the theory of liquidity preference; the IS curve shows the points that satisfy equilibrium in the goods market, and the LM curve shows the points that satisfy equilibrium in the money market; the intersection of the IS and LM curves shows the interest rate and income that satisfy equilibrium in both markets

#### 2 Equations

IS— $Y = C(Y-T) + I(r) + G$

LM— $M/P = L(r, Y)$

-the model takes fiscal policy ( $G$  and  $T$ ), monetary policy  $M$ , and the price level  $P$  as exogenous to get the endogenous  $Y$  and ( $r$ )

-all in all these things help to determine the short-run fluctuations in the economy

## Aggregate Demand II

### 1. How Fiscal Policy Shifts the IS Curve and Changes the Short-Run Equilibrium

- IS-LM is a qualitative model; macroeconomic models are quantitative
- fiscal policy shifts the IS curve and monetary policy shifts the LM curve
- IS curve represents the equilibrium in the market for goods and services, and the LM curve represents the equilibrium in the market for real money balances, and together they determine the interest rate and national income in the short-run when the price level is fixed
- IS-LM model provides a theory of the slope and position of the aggregate demand curve; the IS-LM model implies a negative relationship between the price level and national income; can tell us what events shift the aggregate demand curve and in what direction
- the IS-LM model is a general theory of the aggregate demand for goods and services; the exogenous variables in the model are fiscal policy, monetary policy, and the price level; the model explains 2 endogenous variables: the interest rate and the level of national income
- increase in  $G$  or a decrease in  $T$  shifts the IS curve to the right (horizontally), raising income  $Y$  and the interest rate ( $r$ ); changes in fiscal policy influence planned expenditure and therefore shift the IS curve
- as higher interest rates depress  $I$ , the increase in income  $Y$  is smaller in the IS-LM model than it is in the Keynesian cross
- an increase in the money supply shifts the LM curve downward (vertical); income  $Y$  rises and interest rates ( $r$ ) decline
- the IS-LM model shows that monetary policy influences income by changing the interest rate
- \*monetary transmission mechanism-** shows how a monetary expansion induces greater spending on goods and services; IS-LM model
- changes in monetary or fiscal policy may influence each other
- the impacts of a change in fiscal policy depends on how the Fed reacts—whether it holds the money supply, the interest rate, or the level of income constant
- whenever we make analyse a change in 1 policy, we must make assumptions about the other policy
- according to IS-LM model, there are many possible outcomes on what effect fiscal policy could have on the economy depending on the Fed's monetary response

### 2 Shocks

1. **IS shocks-** exogenous changes in the demand for goods and services; animal spirits and changes in demand
2. **LM shocks-** exogenous changes in the demand for money; new restrictions on credit



- the IS curve represents the negative relationship between the interest rate and the level of income that arises from equilibrium in the market for goods and services; the LM curve represents a positive relationship between the interest rate and the level of income that arises from equilibrium in the market for real money balances
- equilibrium in the IS-LM model—the intersection of the IS and LM curves—represents simultaneous equilibrium in the market for goods and services and in the market for real money balances
- the interest rates and the money supply are both instruments of the Fed's monetary policy; interest rates are easier to measure than the money supply
- 1 answer to why the Fed uses interest rates instead of the money supply as a short-term policy instrument, is that shocks to the LM curve are more prevalent than shocks to the IS curve; when the Fed targets interest rates, it automatically offsets LM shocks by altering the money supply, but the policy exacerbates IS shocks; if LM shocks are the more prevalent type, then a policy of targeting the interest rate leads to greater economic stability than a policy of targeting the money supply
- the Fed has an interest rate target, and they buy/sell bonds to shift the LM curve to change the interest rate

## **2. IS-LM as a Theory of Aggregate Demand**

- IS-LM curve shows the position and slope of the AD curve with changing prices
- AD curve shows relationship between price level and national income; relationship derived from the quantity theory of money—for a given money supply, a higher price level implies a lower level of income; increases in the money supply shift the AD curve to the right, and decreases in the money supply shift the AD curve to the left
- the aggregate demand summarises the results from the IS-LM model by showing equilibrium income at any given price level; the aggregate demand curve slopes downward because a lower price level increases real money balances, lowers the interest rate, stimulates investment spending, and thereby raises equilibrium income
- a change in income in the IS-LM model resulting from a change in the price level represents a movement along the AD curve; a change in income in the IS-LM model for a fixed price level represents a shift in the AD curve
- expansionary fiscal policy—an increase in government purchases or a decrease in taxes—shifts the IS curve to the right; this shift in the IS curve increases the interest rate and income; the increase in income represents a rightward shift in the aggregate demand curve; similarly, contractionary fiscal policy shifts the IS curve to the left, lowers the interest rate and income, and shifts the aggregate demand curve to the left
- expansionary monetary policy shifts the LM curve downward; this shift in the LM curve lowers the interest rate and raises income; the increase in income represents a rightward shift of the aggregate demand curve; similarly, contractionary monetary policy shifts the LM curve upward, raises the interest rate, lowers income, and shifts the aggregate demand curve to the left
- Keynesian assumption is that prices are sticky; the classical assumption is that prices are flexible (assumes output equals the natural rate)

### 3. The Great Depression

-the Great Depression gave rise to short-run macroeconomic theory, for it led Keynes and others to determine that AD was the key to understanding fluctuations in NI  
 -thus with hindsight, the IS-LM model can explain the various explanations of this traumatic downturn

#### 2 Hypotheses

##### 1. Spending Hypothesis- Shocks to IS curve

-resulted in contractionary shift in the IS curve; fiscal policy, C, and I all contributed  
 -places blame for Depression from exogenous fall in spending on goods and services; decline in income coincided with falling interest rates in the 1930s

##### 2. Money Hypothesis- Shocks to LM curve

-resulted in a contractionary shift in the LM curve  
 -places blame on the Fed letting the money supply drop by so much

#### 2 Issues With Money Hypothesis

1. real money balances didn't drop; prices dropped with money supply
2. interest rates should have risen, but interest rates fell as well

#### 2 Effects of Falling Prices- Money Hypothesis Again

-if the falling money supply was responsible for the falling price level, it still could have been responsible

-deflation can be either stabilising or de-stabilising; 2 de-stabilising effects

\***Pigou effect**- falling prices expand income; falling prices should have stabilised the economy through deflation

\***debt-deflation theory**- unexpected deflation hurts debtors and helps creditors; now debtors owe more purchasing power to creditors; if debtors and creditors have equal propensities to spend, they would be equal off, but debtors spend more, so a free-distribution of wealth occurs

-changes in expected inflation shift the IS curve; investment falls because firms worry about having to pay back more in the future; fall in I leads to fall in planned expenditure, which depresses income, which reduces demand for money, which reduces the nominal interest rate, which means the interest rate falls by more than expected deflation, so the real interest rate rises—IS curve shifts downward

-investment depends on the real interest rate and money demand depends on the nominal interest rate

-to find the AD curve, we must find the level of income Y that satisfies the IS and LM curves

-those who value fiscal policy over monetary policy argue that the responsiveness of investment to the interest rate is small (vertical IS curve); those who value monetary policy over fiscal policy argue that the responsiveness of money demand to the interest rate is small (vertical LM curve)

## Aggregate Demand in the Open Economy

### 1. Mundell-Fleming Model

-the Mundell-Fleming model is the IS-LM model for a small open economy with perfect capital mobility (home  $(r)$  is world  $(r)$ ); it takes the price level as given and then shows what causes fluctuations in income and the exchange rate; IS-LM is a closed economy model

-the behaviour of an economy depends on the exchange-rate system it has adopted

-some countries are actually small open economies; Belgium, Netherlands

-the small economy has perfect capital mobility; according to the Mundell-Model, these 2 equations describe this economy

-the intersection of the  $IS^*$  and  $LM^*$  curves (holding interest rate constant at the world interest rate) shows the level of income and the exchange rate that satisfy equilibrium both in the goods market and in the money market

$Y = C(Y-T) + I(r^*) + G + NX(e)$ ; fiscal policy

-this equation states that aggregate income  $Y$  is the sum of  $C$ ,  $I$ ,  $G$ , and  $NX$ ;  $C$  depends positively on  $DI (Y-T)$ ;  $I$  depends negatively on  $(r)$ , which equals the world interest rate  $(r^*)$ ;  $NX$  depends negatively on the exchange rate  $(e)$

-the IS curve is derived from the net-exports schedule and the Keynesian Cross

-the higher the exchange rate, the lower net exports, the lower the level of income

$M/P = L(r^*, Y)$ ; monetary policy

-this equation states that the supply of real money balances,  $M/P$ , equals the demand  $L(r, Y)$ ; the demand for real money balances depends negatively on the interest rate, which now equals the world interest rate  $r^*$ , and positively on income  $Y$ ; the money supply  $M$  is an exogenous variable controlled by the central bank, and because the Mundell-Fleming model is designed to analyse short-run fluctuations, the price level  $P$  is also assumed to be exogenously fixed

-the  $LM^*$  curve is vertical; the intersection of the standard LM curve and the horizontal line representing the world interest rate  $(r^*)$  determines the level of income  $Y$ , regardless of the exchange rate

### 2. Small Open Economy Under Floating Exchange Rates

-floating exchange rates are the most common in the world today

#### 3 Policies

##### 1. Fiscal Policy

-an increase in  $G$  or a decrease in  $T$  shifts the IS curve to the right; this raises the exchange rate but has no effect on income

##### 2. Monetary Policy

-an increase in the money supply shifts the LM curve to the right, lowering the exchange rate and raising income

### 3. Trade Policy

- a tariff or import quota shifts the net-exports schedule to the right; as a result, the IS curve shifts to the right, raising the exchange rate and leaving income unchanged
- the Mundell-Fleming model shows that fiscal policy does not influence aggregate income under floating exchange rates; a fiscal expansion causes the currency to appreciate, reducing net exports and offsetting the usual expansionary impact on aggregate income; fiscal policy does influence aggregate income under fixed exchange rates

### 3. Small Open Economy Under Fixed Exchange Rates

- system common in 1950s to 1970s; the central bank stands ready to buy or sell the domestic currency for foreign currencies at a predetermined price
- a fixed exchange rate dedicates a country's monetary policy to the single goal of keeping the exchange rate at the announced level; the essence of a fixed-exchange rate system is the commitment of the central bank to allow the money supply to adjust to whatever level will ensure that the equilibrium exchange rate equals the announced exchange rate
- as long as the central bank stands ready to buy or sell foreign currency at the fixed exchange rate, the money supply adjusts automatically to the necessary level
- the gold standard automatically fixes exchange rates, as each country agrees to exchange 1 unit of currency for a specified amount of gold; the actual transportation of gold makes arbitrage profits more costly however

#### Equilibrium rate initially exceeds the fixed level

-arbitrageurs will buy foreign currency in foreign-exchange markets and sell it to the Fed for a profit; this process automatically increases the money supply, shifting the LM curve to the right and lowering the exchange rate

#### Equilibrium rate is initially below the fixed level

-arbitrageurs will buy dollars in foreign-exchange markets and use them to buy foreign currency from the Fed; this process automatically reduces the money supply, shifting the LM curve to the left and raising the exchange rate

### 3 Policies

#### 1. Fiscal Policy

-a fiscal expansion shifts the IS curve to the right; to maintain the fixed exchange rate, the Fed must increase the money supply, thereby shifting the LM curve to the right; hence, in contrast to the case of floating exchange rates, under fixed exchange rates a fiscal expansion raises income

#### 2. Monetary Policy

-if the Fed tries to increase the money supply, it will put downward pressure on the exchange rate; to maintain the fixed exchange rate, the money supply and the LM curve must return to their initial positions; hence, under fixed exchange rates, normal monetary policy is ineffectual

-revaluations and devaluations are types of monetary policy however

\***revaluation**- increase in the value of the currency; shifts the LM curve to the left, reducing net exports and lowering aggregate income

**\*devaluation**- reduction in the value of the currency; shifts the LM curve to the right, acting like an increase in the money supply under a floating exchange rate—thus expanding net exports and raising aggregate income

### **3. Trade Policy**

-a tariff or an import quota shifts the IS curve to the right; this induces an increase in the money supply to maintain the fixed exchange rate, hence, aggregate income increases as does savings and net exports

-the Mundell-Fleming model shows that monetary policy does not influence aggregate income under fixed exchange rates; any attempt to expand the money supply is futile, because the money supply must adjust to ensure that the exchange rate stays at its announced level; monetary policy does not influence aggregate income under floating exchange rates

-the Mundell-Fleming model shows how the power of monetary and fiscal policy depends on the exchange-rate regime

### **4. Interest-Rate Differentials**

-interest rates should balance to the world interest rate

#### ***2 Reasons Interest Rates Differ***

1. country/political risk
2. exchange-rate expectations

-an increase in the risk premium associated with a country drives up its interest rate; because the higher interest rate reduces investment, the IS curve shifts to the left; because it also reduces money demand, the LM curve shifts to the right; income rises, and the exchange rate depreciates

#### ***3 Reasons Income Doesn't Rise From Country Risk***

1. central bank wants to avoid depreciation by decreases money supply
2. the depreciation of the domestic currency may suddenly increase prices
3. residents may increase their demand for money, as money is the safest asset

-if investors are wary of holding assets in a country, the interest rate in that country may exceed the world interest rate by some risk premium; according to the Mundell-Fleming model, an increase in the risk premium causes the interest rate to rise and the currency of that country to depreciate

-the expectation that a currency will lose value in the future causes it to lose value today; because a higher interest rate reduces investment, the long-run implication is reduced capital accumulation and lower economic growth

-rising risk premiums is what Mexico in 1994 and Asia in 1997

### **5. Should Exchange Rates be Floating or Fixed?**

-there are advantages to both floating and fixed exchange rates; floating exchange rates leave monetary policymakers free to pursue objectives other than exchange-rate stability, as the exchange rate is just one of macroeconomic variables monetary policy can affect; fixed exchange rates reduce some of the uncertainty in international business transactions

-fixed exchange rates discipline a nation's monetary system and prevent excessive growth in the money supply; fixing the exchange rates is simpler to implement than other policy rules, but this policy may lead to greater volatility in income and employment

-during periods of fixed exchange rates, countries may change the value of their currency if maintaining the exchange rate conflicts too seriously with other goals; during periods of floating exchange rates, countries often use formal or informal targets for the exchange rate when deciding whether to expand or contract the money supply

-no system is fully fixed or floating

-the monetary union is the most extreme case of a fixed exchange rate

-when countries with a common currency experience a recession, there is little they can do to combat with monetary policy, as the central bank controls the monetary policy

### ***EU Disadvantages***

1. low labour mobility

2. no fiscal policy

### ***EU Advantages***

1. travelling and international trade

2. political advantage of connection between countries; wars and trade

-with fixed exchange rates pegged to another unit, the bank must hold sufficient reserves of that unit

**\*speculative attack**- when fixed exchange rate is used, and a change in people's perceptions makes the fixed exchange rate untenable; self-fulfilling rumours

-a currency board, where the bank holds enough units of that currency to be exchanged for the domestic currency outstanding

-a further step is dollarisation, whereby the country replaces its currency with the dollar; this happens by default in high inflation countries, but countries that do so lose the small seigniorage revenue

-there is also a small loss of pride with using another government's currency; this could be reduced by

## **6. Mundell-Fleming Model with a Changing Price Level**

-when the price level falls, the LM curve shifts to the right, the equilibrium level of income rises, the exchange rate depreciates; the AD curve summarises the negative relationship between the price level and the level of income

-just as the IS-LM model explains the AD curve in a closed economy, the Mundell-Fleming model explains the AD curve for a small open economy; in both cases, the AD curve shows the set of equilibria that arise as the price level varies—and in both cases, anything that changes the equilibrium for a given price level shifts the AD curve; policies that raise income shift the AD curve to the right, policies that lower income shift the AD curve to the left

-in summary: at the short-run equilibrium, the demand for goods and services is too low to keep the economy producing at a natural rate; over time, low demand causes the price level to fall, that fall in price level raises real money balances, shifting the LM curve to the right—the real exchange rate depreciates, so net exports rise and the economy eventually reaches the long-run equilibrium

-the speed of transition between the short-run and long-run equilibria depends on how quickly the price level adjusts to restore the economy to the natural rate

-monetary and fiscal policy influence income and the exchange rate, and the behaviour of the economy depends on whether the exchange rate is fixed or floating

-large open economy's combine the behaviour of a closed and open economy; in a closed economy, a monetary contraction raises the interest rate, lower investment, and thus lowers aggregate income; in a small open economy with a floating exchange rate, a monetary contraction raises the exchange rate, lowers net exports, and thus lowers aggregate income; the interest rate is unaffected, as it is determined by world financial markets

-the large open economy is an average of the closed economy and the small open economy; to find out how any policy will affect any variable, find the answer in the 2 extreme cases and take an average

## Aggregate Supply

### 1. 3 Models of Aggregate Supply

- there is always a temporary tradeoff between inflation unemployment; there is no permanent trade-off; the temporary trade-off comes not from inflation per se, but from most economists analyse short-run fluctuations in aggregate income and the price level unanticipated inflation, which generally means from a rising rate of inflation
- using the model of AD and AS; IS-LM and Mundell-Fleming show how changes in monetary and fiscal policy and shocks to the money and goods market shift the AD curve; 3 theories explain the position and slope of the AS curve
- in the long-run when prices are flexible, the AS curve is vertical and shifts in the AD curve affect the price level, but the output of the economy remains at its natural rate; in the short-run prices are sticky and the AS curve is not vertical, and shifts in AD do cause fluctuations in output
- the 3 theories of aggregate supply—the sticky-wage, imperfect-information, and the sticky-price models—attribute deviations of output and employment from the natural rate to various market imperfections
- the real wage is slightly procyclical, not countercyclical as Keynes suggested; the real wage tends to rise when output rise, and therefore abnormally high labour costs cannot explain the low employment and output observed in recessions
- we assume traditional frictions, but we have to examine more closely the frictions (market imperfections) of macroeconomics
- in order of development, the 3 models of AS help explain the market frictions
- in each model, some frictions cause the output of the economy to deviate from the classical model
- as a result of the frictions, the AS curve is upward sloping, rather than vertical, and shifts in the AD curve cause the level of output to deviate temporarily from the natural rate—these temporary deviations represent the booms and busts of the business cycle
- all 3 models go to the same destination of a short-run AS equation

$$Y = Y^1 + \alpha(P - P^E) \quad \alpha > 0$$

- where, Y is output,  $Y^1$  is the natural rate of Y, P is the price level, and  $P^E$  is the expected price level
- this equation states that Y deviates from its natural rate when the price level deviates from the expected price level;  $\alpha$  indicates how much output responds to unexpected changes in the price level;  $1/\alpha$  is the slope of the AS curve
- each model represents a particular reason about why unexpected movements in the price level are associated with fluctuations in aggregate output

### 3 Models

#### 1. Sticky-Wage Model



- sluggish adjustment of nominal wages explains the upward sloping AS curve; wages are sticky in the short-run for business and social reasons
- shows what a sticky nominal wages implies for AS
- because the nominal wage is stuck, an increase in the price level reduces the real wage, and the lower real wage raises the quantity of labour demanded, thereby raising output
- this positive relationship between the price level and the amount of output means that the AS curve slopes upward during the time when the nominal wage can't adjust

## **2 Assumptions**

1. nominal wage set in advance
  2. labour demanded not set in advance; firms hire as much as they want
- the nominal wage is created by the target real wage and the expected price level; the real wage comes from the difference between the expected and actual price levels, which aren't known until after the wages are set and the period begins and ends

## **2. Imperfect-Information Model**

- assumes that markets clear, unlike the sticky-wage model—all wages and prices are free to adjust to balance supply and demand; the short-run and long-run AS curves differ because of temporary misconceptions about prices
- assumes that each supplier in the economy produces a single good and consumes many goods; because the number of goods is so large, suppliers cannot observe all prices at all times; they monitor closely the prices of what they produce but less closely the prices of all goods they consume; because of imperfect information, they sometimes confuse changes in the overall level of prices with changes in relative prices—this confusion influences decisions about how much to supply, and it leads to a positive relationship between the price level and output in the short run
- when actual prices exceed expected prices, suppliers raise their output; output deviates from the natural rate when the price level deviates from the expected price level

## **3. Sticky-Price Model**

- emphasises that firms do not instantly adjust prices they charge in response to demand
- some prices are set by long-term contracts, and the firm also doesn't want to annoy their regular customers or the way the market is structured (magazines and catalogues)
- the sticky-price model emphasises the goods market but also considers the labour market; if a firm's price is stuck in the short run, a reduction in AD reduces the amount that the firm is able to sell; the firm responds to the drop in sales by reducing its production and demand for labour
- in contrast to the sticky-wage model: the firm here does not move along a fixed labour demand curve; instead, fluctuations in output are associated with shifts in the labour demand curve; because of these shifts in labour demand, employment, production, and the real wage can all move in the same direction—thus, the real wage can be procyclical

-according to the imperfect-information model: internationally speaking, countries with volatile AD curves will have steeper AS curves, the aggregate price level fluctuates widely and thus unexpected changes in the price level do not correspond to changes in relative price—countries with stable AD, changes in prices are changes in relative prices and so suppliers are more responsive to unexpected price changes, making the AS curve relatively flat

- according to the sticky-wage model: a high rate of inflation also corresponds to a steep short-run AS curves, as high inflation means frequent price changes are necessary to maintain profits—more frequent price changes allow the overall price level to adjust more quickly to AD shocks; low inflation results in a flat short-run AS curve—fluctuations in AD have large effects on output and are slowly reflected in prices
- high inflation tends to erode the friction that causes prices to be sticky
- according to all 3 theories, output rises above the natural rate when the price level exceeds the expected price level, and output falls below the natural rate when the price level is less than the expected price level
- the models are compatible with each other; they show that long-run monetary neutrality and short-run monetary neutrality are perfectly compatible

## 2. Inflation, Unemployment, and the Phillips Curve

- inflation and employment are conflicting goals—the tradeoff between inflation and employment is the Phillips curve
- economists often express AS in a relationship called the Phillips curve
- \***Phillips curve**- says that inflation depends on expected inflation, the deviation of unemployment from its natural rate, and supply shocks; according to the Phillips curve, policymakers who control AD face a short-run tradeoff between inflation and unemployment
- is a reflection of the short-run AS curve: as policymakers move the economy along the short-run AS curve, unemployment and inflation move in opposite directions
- states that the inflation rate depends on 3 things: expected inflation, cyclical unemployment (deviation from natural rate), and supply shocks
- the Phillips curve and the short-run AS equation both show similar macroeconomic ideas: they show a link between real and nominal variables that causes the classical dichotomy (theoretical separation of real and nominal variables) to break down in the short run; short-run AS supply curve shows output is related to unexpected changes in the price level, and the Phillips curve that employment is related to unexpected changes in the inflation rate

$$\pi = \pi^e - \beta(u - u^n) + v$$

- \***adaptive expectations**- ( $\pi^e$ ) people form inflation expectations based on recently observed inflation; for Phillips curve purposes—this means the inflation rate equals the last year's inflation rate (**nonaccelerating inflation rate of unemployment NAIRU**)
- this implies inflation has inertia; like an object moving through space, inflation keeps going unless there is something there to stop it; if inflation is at the NAIRU and if there are no supply shocks, the continued rise in price level neither speeds up nor slows down
- this inertia arises because past inflation influences expectations of future inflation and because these expectations influence the wages and prices that people set
- inflation inertia pushes the AS and AD curves upward until recessions or contractions stop them

### 2 Causes of Rising and Falling Inflation

#### 1. demand-pull inflation- $\beta(u - u^n)$

-shows that cyclical unemployment, exerts upward or downward pressure on inflation; low unemployment pulls the inflation rate up, because high AD is responsible for, and high unemployment pulls the inflation rate down;  $\beta$  measures how responsive inflation is to cyclical unemployment

## **2. cost-push inflation-** (v)

-shows that inflation also rises and falls because of supply shocks; adverse supply shocks are generally events that push up the costs of production; beneficial supply shocks cause (v) to be negative and inflation to fall

-the short-run tradeoff between inflation and unemployment depends on the expected inflation; the curve is higher when expected inflation is higher

-in the short-run, inflation and unemployment are negatively related; at any point in time, a policymaker who controls AD can choose a combination of inflation and unemployment on this short-run Phillips curve

-because people adjust their expectations of inflation over time, the tradeoff between inflation and unemployment only holds in the short run

\***sacrifice ratio**- % of a year's GDP that must be foregone to reduce inflation by 1%; can also be expressed in terms of unemployment (Okun's Law)

-can be used to estimate by how much and for how long unemployment must rise to reduce inflation

-the Phillips curve shows that in the absence of a beneficial supply shock, lowering inflation requires a period of high unemployment and reduced output; policymakers must know how much output they will lose before implementing a disinflation policy

\***rational expectations**- people use all relevant information, including current government policies and past history, to form inflation expectations

-theory of rational expectations says that people change expectations according to changes in fiscal and monetary policy

-advocates of rational expectations argue that the short-run Phillips curve does not accurately represent the options that policymakers have available; if policymakers are credibly committed to reducing inflation, rational people will understand and will lower their expectations—inflation can then come down without a drop in output—sacrifice ratio not important

## **2 Requirements of Painless Disinflation**

1. the plan to reduce inflation must be announced before the workers and firms who set their prices can form expectations

2. the workers and firms must believe the announcement

-if both requirements are met, the announcement will immediately shift the short-run tradeoff between inflation and unemployment downward, permitting a lower rate of inflation without higher unemployment

-a cold turkey approach to disinflation with rapid results yields a smaller sacrifice ratio than gradual disinflation ( less output lost)

-if expected inflation depends on recently observed inflation, then inflation has inertia, which means that reducing inflation requires either a beneficial supply shock or a period of high unemployment and reduced output; if people have rational expectations, however,

then a credible announcement of a change in policy might be able to influence expectations directly, and therefore, reduce inflation without causing a recession

**\*natural rate hypothesis**- fluctuations in AD affect output and employment only in the short run; in the long run, the economy returns to the levels of output, employment, and unemployment described by the classical model

-allows economists to study separately short and long run developments in the economy; it is 1 expression of the classical dichotomy

**\*hysteresis**- explains the long-lasting influence of history on the natural rate of unemployment; suggest AD may affect output and employment even in the long run  
-most economists accept the natural-rate hypothesis, according to which fluctuations in AD have only short-run effects on output and unemployment; yet some economists have suggested ways in which recessions can leave permanent scars on the economy by raising the natural rate of unemployment

-recessions can permanently affect the economy if it changes the value of the people who become unemployed; can change attitudes as well; may change wage setting process (different amounts of influence)

-if hysteresis is true, it raises the sacrifice ratio, because output is lost even after the period of disinflation is over; greatly increases the costs of recessions

# V. Macroeconomic Policy Debates

## Stabilisation Policy

### 1. Active of Passive Policy

- the central debate is whether the economy is inherently stable or unstable
- when the government is considering changes in monetary or fiscal policy, they must consider how the change will influence inflation and unemployment and whether AD needs to be stimulated or restrained
- advocates of active policy view the economy as subject to frequent shocks that will lead to unnecessary fluctuations in output and employment unless monetary or fiscal policy responds; many believe that economic policy has been successful in stabilising the economy
- advocates of passive policy argue that because monetary and fiscal policies work with long and variable lags, attempts to stabilise the economy are likely to end up being destabilising; in addition, they believe that our present understanding of the economy is too limited to be useful in formulating successful stabilisation policy and that inept policy is a frequent source of economic fluctuations
- policy implementation is not like driving a car, effects are not immediately known; more like a ship, where the course can go offtrack very easily
- \***inside lag**- the time between a shock to the economy and the policy action responding to that shock; arises because it takes time for policymakers to first realize that a shock has occurred and then to put appropriate policies into place
- \***outside lag**- the time between a policy action and its influence on the economy; arises because policies do not immediately influence spending, income, and employment
- a long inside lag is a central problem with using fiscal policy for economic stabilisation; shorter in parliamentary systems like UK where policy can be implemented more quickly
- monetary policy has a much shorter inside lag than fiscal policy, because the central bank can implement policy quick; but monetary policy has a substantial outside lag
- \***automatic stabilisers**- policies that stimulate or depress the economy when necessary without any deliberate policy change; income tax, unemployment insurance, welfare—fiscal policy with 0 inside lag
- \***leading indicators**- a data series that fluctuates in advance of the economy; forecasting purposes
- macroeconomic models are also used for forecasting; the predictions are only as good as the model and the forecasters' assumptions
- economics is a young science, but there is a lot that can be known from expectations

**\*Lucas critique-** criticism of traditional policy evaluation; standard economic models do not consider the impact of policy on expectations

-evident in the disinflation/sacrifice ratio issue: sacrifice ratio is based on adaptive expectations not rational expectations

### ***2 Lessons of Lucas Critique***

1. narrow lesson- economists evaluating alternative policies need to consider how policy affects expectations, and therefore behaviour

2. broad lesson- policy evaluation is hard, so economists engaged in this task should be sure to show the requisite humility

-historical record should be considered when deciding between active and passive policy: if active has worked, continue with it

### **2. Policy by Rule of Discretion**

-second topic of debate is whether policy should be by discretion or rule

-can be active or passive and still be by rule or discretion

-advocates of discretionary policy argue that discretion gives more flexibility to policymakers in responding to various unforeseen situations

-advocates of policy rules argue that the political process cannot be trusted; they believe that politicians make frequent mistakes in conducting economic policy and sometimes use economic policy for their own political ends; in addition, advocates of policy rules argue that a commitment to a fixed policy rule is necessary to solve the problem of time inconsistency

-incompetence or opportunistic politicians will yield the need for policy by rule; also are simple partisan differences between politicians

**\*political business cycle-** manipulation of the economy for electoral gain

-if policymakers can be trusted, the still may be time inconsistent

**\*time inconsistency-** policy makers may be inconsistent over time; so to be most credible, they may want a commitment to a fixed policy rule

-rational agents will understand the incentive for the policymaker to renege, and this expectation affects their behaviour; the solution is to take away the policymaker's discretion with a credible commitment to a fixed policy rule

### ***3 Policy Rules***

#### **1. monetarist**

#### **2. nominal GDP targeting**

-if nominal GDP rises above the target, the Fed reduces money growth to dampen AD; if it falls below the target, the Fed raises money growth to stimulate AD

-allows monetary policy to adjust to changes in V of money

#### **3. inflation targeting**

-like nominal GDP targeting, sets a target and adjusts the money supply when the actual inflation deviates from the target; like nominal GDP targeting, inflation targeting insulates the economy from changes in the V of money; also easy to explain to the public

-rules could also be expressed in terms of real variables instead of nominal variables; usually targeted within a range

**\*monetarists-** advocate the Fed keep the money supply growing at a constant rate

- they believe that fluctuations in the money supply are responsible for most large fluctuations in the economy; slow and steady growth in the money supply would yield stable output, employment, and prices
- steady growth in the money supply stabilises AD only if the V of money is stable; but sometimes, the economy experiences shocks, such as shifts in money demand, that cause velocity to be unstable—a policy rule must be able to adjust to various shocks to the economy
- Taylor's rule has the real federal funds rate—the nominal rate – inflation—responding to inflation and the GDP gap
- central bank independence tends to lead to lower inflation and greater operating efficiency
- good to have different sides that prefer inflation to unemployment

## Government Debt

### 1. Size of the Government Debt

- the government borrows from the private sector to finance the budget
- because the Northern states had larger debts outstanding, the capital was located in the South
- the current debt of the US is of moderate size compared to the debt of other countries or compared to the debt of the US throughout its history; the 1980s and early 1990s were unusual in that the ratio of debt to GDP increased during a period of peace and prosperity; since 1995 the debt-GDP ratio has declined substantially
- US debt rose from 1980 – 1995 (Reagan), but there was no war or recession
- Japan and Italy have the highest debt, more than annual GDP; Norway and Australia have small debt, US is in the middle
- the debt-GDP ratio rises substantially during wars and falls during peace time
- deficit financing of wars appears optimal for reasons of both tax smoothing and generational equity

### 2. Problems in Measurement

- standard measures of the budget deficit are imperfect measures of fiscal policy because they do not correct for the effects of inflation, do not offset changes in government liabilities with changes in government assets, omit some liabilities altogether, and do not correct for the effects of the business cycle
- most believe the measurement of the deficit is not as simple as revenues minus expenditures

#### *4 Measurement Problems*

##### 1. inflation

- least controversial of the measurement issues; currently measured in nominal terms, better economic term if it is measured in real terms

##### 2. capital assets

- government does not capital budgeting for their budget accounting; main issue is which government expenditures should count as capital expenditures—highways and buildings?
- capital assets are therefore expensed and not counted as assets

##### 3. uncounted liabilities

- just as capital assets aren't counted, many liabilities aren't as well; worker's pensions, social security, contingent liabilities (transfer payments, FDIC, ....)
- which to include and how to value them

##### 4. business cycle

- deficit naturally increases during recessions as tax income fall and transfer payments rise
- not errors in measurement, but makes it difficult to monitor changes in fiscal policy
- \***cyclically adjusted budget deficit**- full-employment deficit; based on estimates of spending and tax revenue if the economy were operating at its natural rate of output and employment; reflects policy changes but not the current stage of the business cycle



**\*generational accounting**- option where the budget surplus is based on what the young are actually paying for in the future

### **3. Traditional View of Government Debt**

-according to the traditional view of government debt, a debt-financed tax cut stimulates consumer spending and lowers national saving; this increase in consumer spending leads to greater AD and higher income in the short run, but it leads to a lower capital stock and lower income in the long run

-current generations benefit from debt and future generations are hurt by it

### **4. Ricardian View of Government Debt**

-according to the Ricardian view of government debt, a debt-financed tax cut does not stimulate consumer spending because it does not raise consumer's overall resources—it merely reschedules taxes from the present to the future; the debate between the traditional and Ricardian views of government debt is ultimately a debate over how consumers behave

**\*Ricardian equivalence**- consumers are forward looking, and therefore base their spending not only on their current income but also on their expected future income; government debt is equivalent to future taxes

-government spending in the future must be reduced for a tax cut to lead to greater spending; the tax cuts must influence present or future purchases, so that they are not financed by future taxes

-private S therefore increases to offset the future tax liability, so even though public S now rises, national S remains the same

-economic views of government depend on several questions: are consumers rational, do consumers face binding borrowing constraints, are they economically linked to future generations through altruistic bequests

### **3 Arguments of Traditional v. Ricardian**

#### **1. myopia**

-argues people are not rational and will spend just because and fail to prepare for the future

#### **2. borrowing constraints**

-traditional view says that consumers value current income more than lifetime income; Ricardian says people base spending on current and future income

-taxpayers essentially get a loan from the tax cut, which they will accept and pay back with interest in the form of tax raises in the future

#### **3. future generations**

-consumers don't expect to have to pay for the future debt, their children will; some however feel that spending is a family decision and families will take into account their children; inheritances is an example

-both views can interpret different debt situations differently as well

### **5. Perspectives on Government Debt**

-most economists oppose a strict rule requiring a balanced budget; a budget deficit can sometimes be justified on the basis of short-run stabilisation, tax smoothing, or intergenerational redistribution of the tax burden

-government debt can potentially have other effects; large government debt or budget deficits may encourage excessive monetary expansion and, therefore, lead to greater inflation; the possibility of running budget deficits may encourage politicians to unduly burden future generations when setting government spending and taxes; a high level of government debt may risk capital flight and diminish a nation's influence around the world—economists differ in which of these effects they consider most important

### ***3 Other Perspectives on Government Debt***

-in addition to Ricardian and Traditional views

-most states must have a balanced budget, several reasons the federal government doesn't

#### **1. stabilisation**

-deficits and surpluses help stabilise the economy; the automatic stabilisers adjust in recessions and booms, and such taxes should not be raised in recessions

#### **2. tax smoothing**

-deficits and surpluses can reduce the distortion of incentives caused by the tax system; keeping tax rates smooth allows more continuity in investment rather than raising and lowering them yearly

#### **3. intergenerational redistribution**

-to pass on war costs to future generations for their freedom so they can bear some of the burden

-there is a link between fiscal and monetary policy as well; when a country has high debt, printing more money raises inflation and the price level but lowers the real value of its debts—this usually doesn't occur as policymakers know better, the central bank is independent, and the government can finance deficit by selling debt

-many think that financing government spending by issuing debt is not ok, and that only if there is unanimous support it should be accepted—essentially advocates a balanced budget approach except in times of emergency

### ***2 Effects of Link Between Budget and Trade Deficits***

-when a government budget deficit reduces national saving, it often leads to a trade deficit, which in turn is financed by borrowing from abroad

1. high government debt can lead to capital flight
2. high government debt can lessen political clout

### ***4 Benefits of Indexed Bonds***

1. lowers inflation risk for borrowers and creditors
2. encourages private sector to do the same—financial innovation
3. reduce government's incentive for surprise inflation
4. provide important data for monetary policy

# VI. More on Microeconomics Behind Macroeconomics

## Consumption

### 1. John Maynard Keynes and the Consumption Function

- households consumption decisions affect economy macroeconomic decisions
- consumption tells us how much we have left for savings, which determines the steady-state capital stock and the level of economic well-being
- the C decision is critical for short-run analysis because of its role in determining AD; C is 2/3 GDP, so fluctuations in C are a key determinant of booms and recessions; IS-LM model shows that changes in consumers' spending plans can be a source of shocks to the economy, and that the MPC is a determinant of the fiscal-policy multipliers
- in relation to disposable income;  $C=C(Y-T)$
- 6 different approaches to explaining C

-Keynes made the C function central in his theory of economic fluctuations; he had no data or computers to use, so instead of using statistical analysis, he made conjectures about the C function based on introspection and casual observation

### 2 Conjectures

#### 1. MPC- marginal propensity to consume

- the amount consumed out of an additional dollar of income between 0 and 1
- crucial to Keynes' suggestion for reducing unemployment; the power of fiscal policy to influence the economy—as expressed by the fiscal-policy multiplier—arises from the feedback between I and C

#### 2. APC- average propensity to consume

- ratio of C to I, falls as income rises; S is a luxury, not essential to his theory

#### 3. I is the primary determinant of C and (r) does not have an important role

- stark contrast to traditional theory; C is determined by current I

$C=C + cY$ —Keynes C function

- where C is consumption, Y is disposable income, and c is the MPC
- the APC conjecture was disproven after WWII, when households spent more (failed secular-stagnation hypothesis)

**\*secular-stagnation hypothesis**- the economy goes into a greater depression unless fiscal policy stimulates AD, as people save more as their income increases  
 -his C function was proven by early studies to be correct in all 3 conjectures  
 -Keynes conjectured that the marginal propensity to consume MPC is between 0 and 1, that the average propensity to consume APC falls as income rises, and that current income is the primary determinant of consumption; studies of household data and short time-series confirmed Keynes' conjectures; yet studies of long time-series found no tendency for the APC to fall as income rises over time

## 2. Irving Fisher and Intertemporal Choice

-forms basis for Modigliani and Friedman's hypotheses  
 -adds future and intertemporal consumption to Keynes current consumption theory  
 -consumers face a budget constraint when deciding on C, and face an intertemporal budget constraint when deciding how much to spend today and save for the future

### 6 Aspects

#### 1. intertemporal budget constraint

-measures the total resources available for consumption today and in the future  
**\*discounting**- interest earned on savings  
 -since future consumption is paid for out of savings that have earned interest, future consumption costs less than current consumption  
 -the factor  $1/(1+r)$  is the price of 2-period consumption measured in terms of first-period consumption: it is the amount of 1-period consumption that the consumer must forgo obtain 1 unit of 2-period consumption

#### 2. consumer preferences

**\*indifference curves**-shows the combinations of 1<sup>st</sup> and 2<sup>nd</sup> period consumption that makes the consumer equally happy; represents the consumers preferences regarding consumption in the 2 periods; curved lines  
 -higher indifference curves are preferred to lower indifference curves; reduction in 1 curve requires an increase in another  
**\*marginal rate of substitution MRS**- slope of the indifference curve; tells us the rate at which the consumer is willing to substitute 2-period consumption for 1-period consumption  
 -as they are curved lines, and as so the MRS depends on the levels of consumption for the 2 periods; when 1-period C is low and 2-period is high, MRS is high; when 1-period C is high and 2-period is low, MRS is low  
 -the set of indifference curves represents a complete ranking of the consumer's preferences

#### 3. optimisation

-the consumer achieves his highest level of satisfaction by choosing the point on the budget constraint that is on the highest indifference curve; at the optimum, the indifference curve is tangent to the budget constraint

#### 4. changes in income affecting C

-an increase in either 1<sup>st</sup> or 2<sup>nd</sup> period income shifts the budget constraint outward; if C in period 1 and C in period 2 are both normal goods, this increase in I raises C in both periods

**\*normal good**- a good a consumer wants more of when their income rises

-consumption smoothing can be used to spread C over the 2 periods with borrowing  
 -Keynes posited that a person's current C depends largely on his current income; Fisher's model says, instead, that C is based on the resources the consumer expects over his lifetime

### **5. changes in real interest rate affecting C**

-an increase in the interest rate rotates the budget constraint; the higher interest rate reduces 1-period consumption and raises 2-period consumption  
 -2 scenarios: when consumer is either a net borrower or saver in the 1<sup>st</sup> period; interest rate increase make 1 better off and 1 worse off

\***income effect**- change in C resulting from movement to a higher indifference curve; makes consumers want more goods in both periods

\***substitution effect**- change in C resulting from a change in the relative price of C in the 2 periods; makes C higher in period 2 if the interest rate rises

-depending on the relative size of the income and substitution effects, an increase in the interest rate could either stimulate or depress savings; they both increase C in the 2<sup>nd</sup> period, but have opposite effects in the 1<sup>st</sup> period

### **6. constraints on borrowing**

-if the consumer cannot borrow, he faces the additional constraint that 1<sup>st</sup> period C cannot exceed 1<sup>st</sup> period income

\***borrowing constraint**- liquidity constraint; C in 1 period must be less than equal to income in period 1

-for those consumers that would like to borrow but cannot, C depends only in current income

-2 C functions: 1 for people who can borrow and 1 for those who cannot

-Japanese borrow less and save more

-recent work on consumption builds on Fisher's model of the consumer; in this model, the consumer faces an intertemporal budget constraint and chooses consumption for the present and future to achieve the highest level of lifetime satisfaction; as long as the consumer can save and borrow, consumption depends on the consumer's lifetime resources

### **3. Franco Modigliani and the Life-Cycle Hypothesis**

-wanted to reconcile the Keynes issue that C depends on lifetime income

-retirement is a big reason why I varies over the person's lifetime

\***life-cycle hypothesis**- says that C depends on wealth as well as I; the intercept of the C function depends on wealth; income varies over the life-time and the consumer can spread income over the periods where they earn less to those where they earn more

-if C depends on wealth, an increase in wealth shifts the C function upward; thus, the short-run C function (which holds wealth constant) will not continue to hold in the long run (as wealth rises over time)

-if the consumer smoothes C over his life (horizontal C line), he will save and accumulate wealth during his working years and then dissave and run down wealth during retirement

-also predicts that S increase over a person's lifetime

\***precautionary saving**- additional savings that result from uncertainty; reason elderly don't dissave as much as well as inheritances

-Modigliani's life-cycle hypothesis emphasises that income varies somewhat predictably over a person's life and that consumers use saving and borrowing to smooth their consumption over their lifetimes; according to this hypothesis, consumption depends on both income and wealth

#### **4. Milton Friedman and the Permanent-Income Hypothesis**

-proposed this to complement Modigliani's life-cycle hypothesis: both use Fisher's theory to argue that  $C$  should not depend on current income alone

\***permanent income hypothesis**- unlike the life-cycle hypothesis, which emphasises a regular pattern to income over the lifetime, this theory posits that people experience random and temporary changes in their incomes from year to year

-income consists of permanent and transitory income

\***permanent income**- part of the income that people expect to persist into the future; average income

\***transitory income**- part of income that people do not expect to persist; random deviation from the average

-states that  $C$  is proportional to permanent income

-emphasises that  $C$  depends on permanent income and not current income (error-in-variables)

-says the APC depends on the ratio of permanent income to current income; APC rises when current income is below permanent income; APC falls when current income is above permanent income

-a permanent tax cut (1964) and temporary increase describes this process:  $C$  will not change in the year of the tax hike (1968)

-emphasises that people are forward looking as well, as they base current consumption on permanent income that will last into the future

-Friedman's permanent-income hypothesis emphasises that individuals experience both permanent and transitory fluctuations in their income; because consumers can save and borrow, and because they want to smooth their consumption, consumption does not respond much to transitory income; consumption depends primarily on permanent income

#### **5. Robert Hall and the Random-Walk Hypothesis**

-derived the implications of the rational expectations for  $C$ ; showed that if the permanent-income hypothesis is correct, and if consumers have rational expectations, then changes in  $C$  over time should be unpredictable

\***random walk**- when changes in a variable are unpredictable; the combination of the permanent-income hypothesis and rational expectations implies that  $C$  follows a random walk

- $C$  follows the life course and surprises;  $C$  increase with raises and decreases with firings

-if consumers obey the permanent-income hypothesis and have rational expectations, then only unexpected policy changes influence  $C$ ; these policy changes take effect when they change expectations

-if consumers have rational expectations, policymakers influence the economy not only through their actions but also through the public's expectations of their actions;

expectations, however, cannot be observed directly—therefore, it is hard to know how and when changes in fiscal policy alter AD

-Hall's random-walk hypothesis combines the permanent-income hypothesis with the assumption that consumers have rational expectations about future income; it implies that changes in consumption are unpredictable, because consumers change their consumption only when they receive news about their lifetime resources

#### **6. David Laibson and the Pull of Instant Gratification**

-Keynes himself said that the C function is a fundamental psychological law

-Laibson has suggested that psychological effects are important for understanding consumer behaviour; in particular, because people have a strong desire for instant gratification, they may exhibit time-inconsistent behaviour and may end up saving less than they would like

## Investment

### 1. Business Fixed Investment

-investment is the most volatile component of GDP; increases in the real interest rate reduce I, and I goes first in recessions before C

-3 types of investment spending: business fixed, residential, inventory

#### 3 Themes

1. all investment spending is inversely related to the interest rate
2. various causes of shifts in investment function: technology, population, economic policies
3. investment is volatile over the business cycle

-largest piece of investment spending:  $\frac{3}{4}$  of the total

-bought by firms for use in future production (business) and is spending for capital assets (fixed)

**\*neoclassical model of investment**- standard model of business fixed investment; examines the benefits and costs to firms of owning capital goods; shows how the level of investment—the addition to the stock of capital—is related to the MPK, the interest rate, and the tax rules affecting firms

-the MPK determines the real rental price of capital; the real interest rate, the depreciation rate, and the relative price of capital goods determine the cost of capital; according to the neoclassical model, firms must invest if the rental price is greater than the cost of capital, and they disinvest if the rental price is less than the cost of capital

-for simplicity, assume 2 types of firms: producers rent from the renter firms

#### 6 Steps

##### 1. the rental price of capital—producer firms

-the real rental price of capital adjusts to equilibrate the demand for capital (determined by the MPK) and the fixed supply; the demand curve slopes downward because the MPK is low when the level of capital is high—at any point in time, the amount of capital in the economy is fixed, so the supply curve is vertical

-events that reduce the capital stock or raise employment, or improve technology raise the equilibrium real rental price of capital

##### 2. the cost of capital—rental firms

-the benefit of owning capital is the rent payments; the 3 costs are: **1)** interest on loans **2)** loss or gain due to price changes **3)** depreciation

**\*real cost of capital**- the cost of buying and renting out a unit of capital measured in units of the economy's output

##### 3 determinants of investment

-the rental firm makes a profit if the MPK is greater than the cost of capital and they thus add to their capital stock; it incurs a loss if the marginal product is less than the cost of capital, and they thus let their capital stock shrink



**\*net investment**- change in capital stock; depends on the difference between the MPK and the cost of capital

-for the firm that owns and uses its capital, the benefit of 1 extra unit of capital is the MPK, and the cost is the cost of capital; this firm adds to its capital stock if the MPK exceeds the cost of capital

-business fixed investment increases when the interest rate falls; a lower interest rate reduces the cost of capital and therefore makes owning capital more profitable

-outward shifts in the I function could be due to an increase in the MPK (technology)

-in the long run, the MPK equals the real cost of capital; the speed of adjustment toward the steady state depends on how quickly firms adjust their capital stock, which in turn depends on how costly it is to build, deliver, and install new capital

#### **4. taxes and investment**

-various parts of the federal tax code influence the incentive to invest; the corporate income tax discourages investment, and the investment tax credit (repealed in the US) encourages it

-also depends on definitions of profits, depreciation classes, and capital goods

#### **5. stock market and Tobin's q**

-some see a correlation between fluctuations in investment and the stock market

-an alternative way of expressing the neoclassical model is to state that investment depends on Tobin's q, the ratio of the market value of installed capital to its replacement cost; this ratio reflects the current and expected future profitability of capital; the higher is q, the greater is the market value of installed capital relative to its replacement cost, and the greater is the incentive to invest

-Tobin's q is similar to neoclassical model; an advantage is that Tobin's q reflects the expected future profitability of capital as well as the current profitability, as incorporates stock prices which react quickly to new information

-the stock market and GDP tend to move together but the relationship is far from precise

#### **6. financing constraints**

-in contrast to the assumption of the neoclassical model, firms cannot always raise funds to finance investment; financing constraints make investment sensitive to firms' current cash flow and they must choose the most profitable investments

-financing constraints make the firm more sensitive to current economic conditions

-banking crises tend to coincide with recessions and the credit crunch results reducing long term investments; banks are less able to serve their role as intermediaries when they become insolvent

## **2. Residential Investment**

-includes new homes for living in and homes to be rented

### **2 Parts**

1. the market for the existing stock of houses determines the equilibrium housing price

2. the housing price determines the flow of residential investment, new housing that is built

-residential investment depends on the relative price of housing; housing prices in turn depend on the demand for housing and the current fixed supply; an increase in housing demand, perhaps attributable to a fall in the interest rate, raises housing prices and residential investment

-similar to the business fixed investment  $q$ ; market price determines the new construction ability

-an increase in the housing demand, perhaps attributable to a fall in interest rates, raises housing prices and residential investment; real interest rates are important housing indicators

-unlike the corporate income tax, the tax code encourages home ownership; does not have to pay tax on imputed rent and can deduct mortgage payments; subsidy depends on inflation—homeowners can deduct the nominal interest payment

-mixed opinions on the home subsidy; some think this drives investment away from more profitable forms of capital and lower taxes would be better

### **3. Inventory Investment**

-1 % of total investment, yet its remarkable volatility is central to economic fluctuations; in recessions, more than half of the decline in spending comes from a decline in inventory investments

#### *Various Motives for Holding Inventories of Goods*

1. smoothing production
2. using them as a factor of production
3. avoiding stock-outs
4. storing work in process

\***accelerator model**- inventory investment model; assumes that firms hold a stock of inventories that is proportional to the firm's level of output

-1 model of inventory investment that works well without endorsing a particular motive is the accelerator model; according to this model, the stock of inventories depends on the level of GDP, and inventory investment depends on the change in GDP

-inventory investment depends on the real interest rate; measures the opportunity cost of holding inventory; high real interest rates discourage inventory investment

## Money Supply and Money Demand

### 1. Money Supply

-the quantity of money is the number of dollars held by the public; the money supply is determined by the behaviour of households (who hold money) and banks (where money is held) and the Fed

$$M = C + D$$

-money supply = currency + demand deposits

-the system of fractional reserve banking creates money, because each dollar of reserves creates many dollars of demand deposits

-the supply of money depends on the monetary base, the reserve-deposit ratio, and the currency-deposit ratio; an increase in the monetary base leads to a proportionate increase in the money supply; a decrease in the reserve-deposit ratio or in the currency-deposit ratio increases the money multiplier and thus the money supply

**\*100-percent reserve banking-** banks just hold deposits, do not make loans; if the bank hold 100% of deposits in reserve, the banking system does not affect the supply of money; banks make no profits, but still may make a small profit for holding the money

-banks can make loans with the reserves they have to stimulate the economy and earn interest for themselves; the banks must keep some reserves on hand so that reserves are available whenever depositors want to make withdrawals

-as long as the amount of new deposits approximately equals the amount of withdrawals, a bank need keep all its deposits in reserves—thus bankers have an incentive to make loans (fractional-reserve banking)

-banks create money in a fractional reserve system according to what the reserve-deposit ratio is; the money creation process continues unfounded

-the banking system's ability to create money is the primary difference between banks and other financial institutions; there are many financial institutions that act as financial intermediaries (transfer of funds from borrowers to savers)—most prominent being the stock market, bond market, and the banking system

-of these institutions, only banks have the legal authority to create assets (checking accounts), that are part of the money supply—banks are the only financial institutions that directly affect the money supply

-fractional reserve does not increase wealth however, as a liability is created when the money is lent; the creation of money by the banking system increases the economy's liquidity or money supply, not its wealth

### *3 Exogenous Variables in Money Supply Model that Determine Money Supply*

**1. monetary base B-** the total number of dollars held by the public as currency C and by the banks as reserves R; directly controlled by the Fed

**2. reserve-deposit ratio rr-** fraction of deposits banks hold in reserve; determined by business policy and laws

**3. currency-deposit ratio cr**- amount of currency C people hold as a fraction of their holding of demand deposits D; reflects the preferences of households about the form of money they wish to hold

$$M = C + D$$

$$B = C + R$$

$$M = (cr+1)/(cr+rr) * B$$

-shows how the money supply depends on the monetary base, reserve-deposit ratio, and currency-deposit ratio

**\*money multiplier m**-  $(cr+1)/(cr+rr)$ ; factor of proportionality

$$M = m * B$$

**\*high-powered money**- monetary base is sometimes called, because it has a multiplied effect on the money supply

-money supply is proportional to the monetary base; lower the reserve-deposit ratio the more loans banks can make; decrease in the currency-deposit ratio raises the money multiplier and the money supply

### **3 Instruments of Monetary Policy**

1. open-market operations

2. discount rate

3. reserve requirements

-banks also hold excess reserves; bank failures led to the decrease in the money supply in 1930 as they led to a higher currency-deposit ratio and raised the reserve-deposit ratio by making bankers more cautious

-the Fed changes the money supply using 3 policy tools: it can increase the monetary base by making an open-market operation or by lowering the discount rate; it can reduce the reserve-deposit ratio by relaxing reserve requirements

## **2. Money Demand**

-money has 3 uses: unit of account, store of value, and medium of exchange; money as a unit of account does not generate demand, because prices can simply be quoted

-the other 2 aspects of money emphasize the theory of demand for money

### **2 Types**

#### **1. portfolio theories**

-emphasize money as a store of value

-people hold money as part of their portfolio as it represents an asset with unique risk and return characteristics; also depends on other assets risk and return and total wealth

-portfolio theories of money demand stress the role of money as a store of value; they predict that the demand for money depends on the risk and return on money and alternative assets

**\*dominated asset**- M1; because as a store of value, it exists alongside other assets that are always better; thus it is not optimal for people to hold it as part of their portfolio, and thus portfolio theories cannot explain holding this type of money

#### **2. transaction theories**

- emphasize the role of money as a medium of exchange
- agree money is a dominated asset and that it is used to make purchases—explains why people hold narrow measures of money
- \***Baumol-Tobin model**- analyses costs and benefits of holding money; benefit is convenience and cost if foregone interest; the individual holds more money depending on the fixed cost of retrieving money from the bank
- transactions theories of money demand, such as the Baumol-Tobin model, stress the role of money as a medium of exchange; they predict that the demand for money depends positively on expenditure and negatively on the interest rate
- the sensitivity of money to income and interest rates determines the slope of the LM curve—thus influencing monetary and fiscal policy

## ***2 Classes of Money***

1. those that are a store of value and medium of exchange (currency, checking accounts)
  2. those that are only a store of value (stocks bonds)—nonmonetary assets; near money
- financial innovation has led to the creation of assets with many of the attributes of money; these near monies make the demand for money less stable, which complicates the conduct of monetary policy
  - \***near money**- those nonmonetary assets that have acquired some of the liquidity of money; existence of complicates monetary policy because they can be easily switched to
  - most of the \$100 in the economy are in the underground economy; this is the best store of value they have; inflation tax is the only way to tax this money; amount of currency per person is \$2000 and half is \$100 bills

## Advances in Business Cycle Theory

### 1. Theory of Real Business Cycles

-real business cycle theory emphasises intertemporal optimisation and forward-looking behaviour, whereas Keynesian theory stresses the importance of sticky prices and other market imperfections

-2 new recent strands of short-run economic fluctuation research: theory of real business cycles and new Keynesian economics

-the theory of real business cycles is an explanation of short-run economic fluctuations built on the assumptions of the classical model, including the classical dichotomy and the flexibility of wages and prices; according to this theory, economic fluctuations are the natural and efficient response of the economy to changing economic distortions, especially changes in technology

-says prices adjust to clear markets just like in microeconomics; emphasises real changes in the economy to explain fluctuations in real economic variables, not nominal variables like the money supply

### *4 Issues About the Steadiness of Growth in the Solow Model*

#### 1. interpretation of the labour market

-workers work fewer hours when the rewards are reduced; workers perform cost-benefit analysis about when the best time to work is based on interest rates, wages, and need for money

**\*intertemporal substitution of labour-** willingness to reallocate hours of work over time

-thus shocks to the economy that cause the interest rate to rise or the wage to be temporarily high cause people to want to work more; mixed feelings on this issue

#### 2. importance of technology shocks

-real business cycle theory says technology regresses during recessions; more plausible assumption that technology just progresses less

**\*Solow residual-** %change in output – %change in inputs; measures proportion of output growth that is attributable to technology improvements; shown to be relevant

### *2 Issues with Solow Residual*

1. labour hoarding- firms keep workers in recessions for the recovery, so this distorts output

2. when demand is low, firms may produce hard to measure items; cleanup, cosmetics

#### 3. neutrality of money

-assumes monetary policy doesn't affect real variables such as output and employment; premise of real business cycle theory and most radical assumption

-probably not true, but not for sure

#### 4. flexibility of wages and prices

-real business cycle theory assumes prices and wages adjust quickly to clear markets

-advocates and critics of real business cycle theory disagree about whether employment fluctuations represent intertemporal substitution of labour, whether technology shocks

cause most economic fluctuations, whether monetary policy affects real variables, and whether the short-run stickiness of wages and prices is important for understanding economic fluctuations

## **2. New Keynesian Economics**

- contrasts real business cycle theory and says market clearing models like the real business cycle theory model cannot explain short-run economic fluctuations
- advocates models with sticky wages and prices and where AD is the primary determinant of NI in the short run; urges abandoning the assumption that wages and prices adjust quickly to equilibrate markets
- new Keynesian urges the IS-LM model as the theory of AD to understand AS; tries to identify the market imperfections that cause the economy to deviate from its natural rate and that makes wages and prices sticky

### ***3 Reasons Prices are Sticky in Short-Run***

#### **1. small menu costs and AD externalities**

- menu costs and AD externalities
- \***aggregate demand externality**- macroeconomic impact of 1 firm's price adjustment on the demand for all other firms' products; firm lowering prices raise real money balances for other goods
- sticky prices may be optimal for those setting prices, even though they are undesirable for the economy as a whole

#### **2. recessions and coordination failure**

- recessions can result and prices may not adjust appropriately because of coordination failure, although this could also be considered as collusion
- prices can be sticky just because people expect them to be sticky, even though stickiness is in no one's interest

#### **3. staggering of wages and prices**

- staggering makes the overall level of wages and prices adjust gradually and thus sticky, even when individual wages and prices change frequently

-new Keynesian research on short-run economic fluctuations builds on the traditional model of AD and AS and tries to provide a better explanation of why wages and prices are sticky in the short run; 1 new Keynesian theory suggests that even small costs of price adjustment can have large macroeconomic effects because of AD externalities; another theory suggests that recessions occur as a type of coordination failure; a third theory suggests that staggering in price adjustment makes the overall price level sluggish in response to changing economic conditions

# Monetary Economics

## **I. Fundamentals of Monetary Theory**

Currency in an Island Economy  
The Monies of a Modern Economy  
The Demand for Money  
Stock and Bond Valuation and the Term Structure of Interest Rates

## **II. Fundamentals of Monetary and Financial Institutions**

Financial Intermediation  
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The Money Supply Process  
Institutions of Monetary Control: Historical Role of the Federal Reserve in the US

## **III. Equilibrium Analysis**

Full Employment and Monetary Policy Neutrality  
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## **IV. Descriptive Dynamics and Inflation**

A Critique of Stabilisation Policy  
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Inflation and Seigniorage: What is Optimal?

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Optimal Targeting and the Response of Financial Markets  
Desk Operations and the Repo Market for Treasuries  
Time Inconsistency and the Credibility of Monetary Policy



# I. Fundamentals of Monetary Theory

## Currency in an Island Economy

### 1. Introduction

- monetary theory is a political process as well (policy); hard to quantify
- currency is based on confidence; there are no real assets to exchange it for
- fiat money is currently the most common, but given the potential problems associated with maintaining its value as a common medium of exchange, it must afford significant benefits; however, many of the benefits typically attributed to money do not require fiat money or even representative commodity money to be realized

### 2 Transactions

1. currency for goods
2. goods for goods- barter

### 3 Economies

1. autarky
2. bilateral exchange economy
3. monetary economy

\***monetary economics**- state in which goods are reallocated via monetary transactions rather than by barter is in pure exchange economies

\***monetary theory**-the study of monetary of economics

\***monetary policy**- the implementation of monetary theory by governmental entities

-the desire for **money** to serve as a medium of exchange is evidenced by the problem of **trading friction** resulting when there is a **lack of double coincidence of wants**

-when there is 1 common thing that all participants are willing to accept, that thing becomes money; it could be corn if everyone was willing to accept corn for barter

-as is, everyone accepts paper (fiat, by legislative decrees) monies for barter

-a monetary policy must be developed and implemented by the keepers of the society; if the society happens to be a monetary economy then a regulatory body must provide a standard for theoretical monetary goals to be attained

-in barter or bilateral exchange economies, no currency standard must be set; the nature of a monetary economy dictates that some entity or group of entities must establish monetary guidelines and valuation principles

- barter and bilateral exchange economies need no valuation because their goods have intrinsic value to the trader and the tradee; fiat currency has no such intrinsic value, and such must have values established for its use by some ruling body
- that said, when several of these ruling bodies (governments) act together, they can influence values even more so than by themselves: EU and AU

#### ***4 Microeconomic Assumptions***

1. individuals maximize utility- utility function
2. given technology available- production function
3. resources it possesses- factors of production
4. the trading environment it faces- monetary system

### **2. Island Economy**

- excellent microeconomic break-down of the origination of the autarkic trading system; general island economy from the ancient beginnings
- in the island economy, whenever households' endowments and production possibility frontiers do not coincide with their preferences, autarkic production and consumption can be improved upon by trade

### **3. Autarky**

- earliest stage of the island economy
- each household produces goods for its consumption only
- utility received each period from each household depends on decisions of quantity of home-produced goods to consumer and amount of leisure time
- these decisions are made jointly by the utility-maximizing household
- the production of durable investment goods in each period is just sufficient to offset the rate at which the durable goods depreciate, thus maintaining a fixed level of capital stock over time
- T time is allocated between leisure time and labour
- all of the output is consumed; the production of perishable goods is just equal to the quantity of perishable goods that households want to consume, and therefore none are wasted
- thus, the average utility received each period by the households is equal to the welfare on the island; this level of welfare is the baseline for all other measurements for advanced economic transaction systems

### **4. Bilateral Exchange**

- barter systems under bilateral exchange

#### ***2 Scenarios***

##### **1. No Intermediate Trades**

- here the households may trade only directly for perishable goods they will consume; this constraint on trade will highlight the effect of specific trading frictions on production and consumption decisions, and ultimately on welfare
- the double coincidence of wants must therefore exist

#### ***Process***

1. because only (perishable) "goods" are being traded, (commodities for which households have positive demands), a set of relative prices can be determined by the

relative strength of the demand's as expressed by the households' utility function; from this 1 per week say supplies and demand can be counted individually and market clearing prices set for the week by the Walrasian auctioneer

**\*Walrasian auctioneer**- fictitious person created by the 19<sup>th</sup> century economist Leon Walras to describe how markets process information and arrive at market-clearing prices; it was the auctioneer's job to match up supplies with demand such that all trades occurred at the single equilibrium price

2. households now increase production (decreasing leisure time), and if the goods clear at the Walrasian prices then nothing is wasted under autarkic principles and all the marginal (utility) conditions for optimality would be met

3. this island economy is assuming immobility of factors of production; that is, it represents an economy in which trade is unrestricted and frictionless (costless)

4. the only market organization is Walrasian auctioneer setting the prices; the households must pack up their goods and travel to homes to find a double coincidence of wants (or they just know throughout the week through gossip)

5. in the second week, Walrasian auctioneer gets a price review again; he finds out that production is less because people spent time finding trade partners, which took away from time for leisure and labour (home and market perishables)

-not all trades were completed either because the cost of "making" those markets was too high; these goods were consumed, by at a diminishing MU

6. overall utility still rises by some, as households produce more perishable goods

## **2. Intermediate Trades**

-innovation in trading

-high transaction costs and low incidence of clearing the market forced the households to look for alternatives

### ***Process***

1. now all households are willing to make the intermediate trades, knowing that if all the markets clear at the correct relative prices, they will have successfully exchanged their home goods for the market clearing goods they desire

2. however, not all trades were completed, and some perishable goods went to waste

3. the households did get closer to desired consumption levels, indicating that the number of missing markets had been reduced; less time was also used in the search for trades (there is not a unique sequence of bilateral trades that would clear the markets; this complicates the search process)

4. more time is freed up from first week, because search time has dropped; production and leisure time can rise again to post-autarkic levels, and consumption can and utility now reach a comfortable balance, even though some output is still wasted

## **5. Commodity Money**

### ***Process***

1. intermediate trade increased utility, but also increased difficulty in trading; the auctioneer quotes the prices for the next week with a common good for the base price (flour)

2. he quotes an item with little change in value from week to week, and uses this as the standard unit of account; there have also been further efficiency improvements during the week from evolution

3. problems still persist: transaction time is draining a lot of labour and leisure time (utility), and missing markets still exist because transactions are conducted at Walrasian prices that are market clearing only when markets are complete
4. utility is also being lost to perishable goods; when intermediate trades cannot be completed, perishable goods cannot be stored; so instead of keeping flour, trade in corn (durable good, used to make flour) which can be stored
  - all households have positive demand for perishable goods, but only some have positive demand for durable goods (the miller has to turn the corn into flour)
5. everything could now be exchanged for corn, since it has an intrinsic value, and the corn can be stored until needed
6. market becomes perfectly decentralized; all transactions become corn for goods, except for a few bilateral exchanges; thus markets now clear and missing markets has been eliminated; because of ability to conduct intertemporal, intermediate trades, specialization of market activities was possible within the household, further reducing time constraints (1 person brings goods too and 1 person return with corn)
7. missing intraperiod markets have now been replaced with completed intertemporal markets; all perishable goods produced are consumed and waste is eliminated
8. the island economy is now a monetary economy; its commodity money is corn
  - because the corn has intrinsic worth and is durable, it is a good store of value; its is a medium of exchange because all will accept it and is a unit of account

### **Ruble**

- the Soviet Union did not transfer its currency before collapse; when it collapsed, there was no value for its currency in the foreign exchange markets; confidence eroded, and some states agencies even stopped accepting rubles for payment
- many industries reverted to barter, and found things like kitchen utensils to trade for intermediate goods

### **6. Representative Commodity Money**

1. corn as a money was better, but transportation costs made carrying bushels of corn cumbersome
2. IOUs are used instead of corn; but, it is difficult to verify authenticity of the IOUs; anyone could just write one up in excess of their corn holdings
3. Walrasian auctioneer first audited the IOU's every week, but is costly
4. instead used a single issuer of IOUs; and anyone could redeem their IOUs for corn with a stated mechanism
5. the auctioneer decided to be the issuer of the IOUs; he bought all the corn with the IOUs, except for the corn being used by the millers; anyone could redeem from the central bank (auctioneer)
  - the IOUs have the same unit of account and store of value as corn, but are superior to corn as a medium of exchange because of portability
6. as the population grows, the demand for more IOUs increases; this means the auctioneer determines fixed exchange rates for both sides of the transaction ( he becomes the monetary authority)
7. what makes this mechanism work is the miller's willingness to exchange IOUs for corn; whenever the miller was willing to pay more than auctioneer, people could

arbitrage by trading IOUs to the auctioneer for corn, and selling the corn to the millers for more IOUs

-this occurs until the miller lowers his prices to that of the auctioneer; this reduces the amount of IOUs in circulation and decreases the corn (money) holdings of the auctioneer  
-opposite effect results in increase in IOUs

## **7. Fiat Money**

1. working well, but corn is a valuable commodity that can be used by the economy; the system is costly to support, with corn backing being the main cost

2. opportunity and other costs could be reduced by reducing the corn stock of the auctioneer

3. the auctioneer determines that IOU transactions for corn is small each period in relation to his total stock of corn; he reasoned he could issue more IOUs without increasing the corn stock pile

4. to do this, he canvasses the market each period, determines the amount of trading to take place, and calculates the quantity of money needed to support those trades so the IOU-corn price is fixed

5. the additional money is now distributed uniformly to households in equal proportions

6. any mistakes in calculations could simply be fixed by IOU-corn exchange operations

7. over time the amount of real resources of corn needed to supply the economy's payment system would become smaller on a per capita basis

8. over time confidence grew in the IOUs, and the auctioneer thus became known as the monetary authority due to his implementations

-thus, the auctioneer could now be counted on to maintain a fixed IOU price of corn by issuing IOUs in the proper amount each period, and without any backing of any kind

9. the households unanimously agreed to redistribute the wealth of corn, and the monetary authority carried out this mandate

10. the additional resources raised consumption, output, and per capital consumption for a period of time, until all the new found wealth had been consumed; afterwards, per-capita consumption, output, and utility returned to their previous levels

11. the economy benefits from consuming the additional resources, but now only the personal integrity and competence of the monetary authority can ensure IOU price stability

12. the economy has evolved into a monetary economy relying strictly on the intrinsic value, which is 0; the term IOU has become a misnomer

## The Monies of a Modern Economy

### 1. Monetary Aggregates

- the monetary aggregates are grouped based on their demand suitability; however, as times change the importance of an aggregate may change as well
- by influencing the rate of expansion of the aggregates, the Fed can enact its monetary policy; these aggregates have stable relationships to macroeconomic variables like GDP and CPI
- the increasing use of credit and debit cards and reliance on electronic fund transfers may mitigate the need for large holdings of monetary assets that have medium-of-exchange features; these changes are not predictable however
- M1 is the group that is most influenced by evolution of the economy's payment system
- money can be exchanged for all goods and all goods for money; but all goods can't be exchanged for all goods; money's advantage is its benefit as a medium of exchange; more efficient
- but there are more mediums of exchange in today's economy than just a single government issued currency; credit cards
- monetary assets (money market) less than 1 year and capital market assets are greater than 1 year
- monetary assets are grouped into aggregates on the basis of their demand suitability with one another by the Fed
- the Fed monitors the total dollar volume of each of the aggregates over time and attempts to identify its behaviour; it examines these variables and analyzes their relationships with macroeconomic indicator variables; these relationships are based on the demand for money by households and firms
- the supply of monetary aggregates (in nominal or current (real) terms) can be strongly influenced by the Fed because of its regulatory authority over the banking system and its monopoly over the currency supply
- to the extent that changes in the supply of the monetary aggregates can influence changes in the real sector of the economy (output, employment), the Fed may be able to influence the real economy
- the decisions on how to regulate the supply of the monetary aggregates are known as the monetary policy decisions of the Fed.

### *3 Properties of Demand Suitability of Money*

1. return
2. risk
3. liquidity

### 2. M1

- all US economy assets that serve as its media of exchange; media of exchange assets have very high liquidity by definition

### *4 Components*

### **1. Currency**

- remained stable since 1959; growing from a 21% to 29% share
- consists of coins and Fed Reserve Notes; fiat money is 90% of currency
- while the Bretton Woods agreements were in place from WWII to 1971, US had representative commodity money

### **2. Demand Deposits**

- fallen from 75% to 34% share; due to emergence of NOW interest bearing checking accounts which make up other checkable deposits

### **3. Traveller's Checks**

- smallest group
- privately issued fiat monies that maintain a fixed exchange rate with the US dollar
- differ from government-issued money because purchaser is receiving insurance against loss or theft
- they are similar from Fed Notes in that they are backed only by the issuer-backing them, either American Express or Citicorp; this has been sufficient to circulate them as a medium of exchange, suggesting that competitive pressures to maintain brand name capital could allow multiple currencies to circulate successfully in the economy, eliminating the need for the federal government's monopoly over the economy's money supply

### **4. Other Checkable Deposits**

- DIDMCA Banking Act 1980 and Garn-St. Germaine allowed for interest bearing checking accounts; now, families writing few checks could use NOW accounts and those with lots of checks could use standard checking account; checking accounts for businesses, termed commercial accounts, are required to still be non-interest bearing; reason for this rationale is that commercial banks could compete with each other for these large business accounts, thereby creating instability in the banking sector due to high volatility of funds, increasing the bank's risks of being short or insolvent
- ways around this are 0-balance checking accounts and earnings credits, where banks accrue credits for interest they would have earned, and these credits are given by the bank as services performed

### **3. M2**

- broader measure than M1; includes all of M1 (media of exchange), and several highly liquid, short-term interest-bearing assets
- 4 times that of M1; 2 major % fluctuations: 1970s inflation rates and DIDMCA Garn-St. Germaine 1980
- in the 1960s, the US was still on the gold standard and there was price stability; inflation was essentially 0, and banks still adhered to Depression-Era Banking Laws that strictly regulated banking and fixed interest-rate ceilings
- interest-rate ceilings were 5% for commercial banks and 5.25% for S&Ls
- principal financial products banks could offer at this time was: demand deposit accounts, passbook savings, and small denomination (non-negotiable) CDs
- CDs gave slightly better rates because they were non-negotiable and tied up money longer
- 1970s inflation hit 14% and households began to look more closely at their short-term assets; there was prohibition of interest payments on demand deposits, making it more

costly for households to use and pay with checks; and interest rate ceilings made a nominal interest rate of at least 14% necessary, but the ceilings were mandated by law

- MMDAs and MMMFs created substantial issues for the Fed's monetary policy; all the new deregulations and new monetary aggregates created definition problems for the Fed and they didn't know how much each new category should be growing by now
- the success of the MMMFs created erratic movements in the volume of the earlier monetary aggregates
- when deciding on where to place MMMFs and MMDAs, they looked at where the funds were coming from; they were all coming from prior M2 products at banks, so they were included in M2; however, legalisation of MMDAs did not entirely reverse disintermediation, as much of the funds flowing into them was coming from original M2 deposits
- and so, the legacy of the 1970s inflation rates is a much more efficient allocation of liquid assets in the US economy; has been reflected in growth of MMMF and businesses' closer watch of cash management services; thus, leading to overnight repo agreements and eurodollar deposits as well
- to avoid double counting, overnights already counted in MMMFs are not counted again; although they are not a large part of M2, they are a large part of the volatility of M2 on a weekly basis

### **5 Components**

#### **1. M1**

-media of exchange

#### **2. Small Time Deposits**

-passbook savings; 50% of M2 in 1950 and 1960 (before MMDA)

#### **3. Savings and MMDAs**

-money market deposit accounts

-MMDAs rose in popularity overnight after they were legalised; 8% to 25% in 5 years

#### **4. MMMFs (retail)**

-money market mutual funds; grew from 0% 1960 to 10% 1980

-grew out of need by Goldman Sachs and other private financial institutions; offered market rates of interest in funds containing M3 and L short-term liquid assets

-big reason for their success was the Fed's high inflation and low interest rate policy

**\*disintermediation-** funds withdrawn from banks and S&Ls and placed in higher interest MMMFs; occurred in the 1970s, and laid the groundwork for the S&L crisis and weakened the banking system and created problems for the Fed in creating monetary policy

-DIDMCA fixed this, and legalised MMDA accounts for banks and S&Ls

### **3 Advantages**

1. households can enter new investment markets

2. diversification; MMDAs more insured than MMMFs; MMMFs don't ensure commercial paper

3. MMMFs complement stock and bond mutual funds

### **5. Overnight Repurchase Agreements**

-contracts for overnight collateralized loans whereby the lender agrees to repurchase the funds the next day at a price that is reduced by the amount of interest that would have accrued on the funds overnight



-1 of the principal sources of collateral is US Treasury securities

#### **6. Overnight Eurodollar Deposits**

-similar to repurchase agreements, but the source of funds is deposit accounts at banks outside the US

-non-US banks lend money overnight to US banks, which return them with interest the following day

#### **4. M3 and L**

-historically much less important in monetary policy

##### **5 M3 Components**

###### **1. M2**

M1 + M2

###### **2. Large Time Deposits**

-jumbo denomination CDs- minimum of \$100,000

-300 billion representing 12% of M3

###### **3. MMMFs (institutions only)**

-\$100,000 denominations for larger institutions

###### **4. Term Repurchase Agreements**

-maturity exceeds 24 hours

###### **5. Term Eurodollar Deposits**

-maturity exceeds 24 hours

##### **5 L Components**

1. M3

2. Short-Term Treasury Securities

3. Commercial Paper

4. US Savings Bonds

5. Bankers' Acceptances

#### **5. Units of Money**

-money demand and money supply are often discussed as though money were a homogeneous asset, which it is not

-the most sensible definition for a unit of money is one based on the relative quantities of various money market instruments in the economy

-use the % of M1, M2, M3, and L; so currency is 29% of the dollar

#### **6. Credit Cards Transactions and Summaries**

-the medium of exchange in credit card transactions is the credit card system

-individual not lose assets, but acquires a debt or a liability; the extent of the debt is restricted by either limits or the individual's prudence

-credit card transactions are normally paid from demand accounts, and thus their impact on the overall demand for money must be analyzed very closely; it is the supply of 1 or more of the credit card feeding aggregates that the Fed is trying to control

-the Fed needs to know how fast the aggregates can be allowed to expand without inducing either a credit crunch (when they expand too slowly) or inflation (when they expand too rapidly)

## The Demand for Money

### 1. Households' Demand for Money

-discusses the theory known as the theory of transactions demand for money and derives an empirical equation; predicts that demand for nominal money balances increases with real income and the price level, and decreases with improvements in the efficiency of the payment system and higher interest rates

-money can be defined as a portfolio of short-term assets; the definition of money can be altered by changing the composition of the portfolio

### 3 Determinants of Demand for Money

1. allocation of income/wealth between consumption and savings

2. allocation of time between labour and leisure

3. portfolio allocation of households' wealth

-so how should the household optimally manage short-term financial asset holdings, one of which is their money

-positive relationship exists between money, income, interest rates, and prices

### 1. Transaction Demand

-household must balance liquidity needs for consumption with interest-bearing needs for savings; income is an addition to wealth

\***average propensity to consume APC**- fraction of income consumed each period

### 2 Consumption Issues

1. income is received in lump sum, but consumed over the period

2. for consumption purchases the household needs liquid assets that are media of exchange since consumption is an exchange of money for goods

\***cash management issue**- least costly way to convert stored income into consumption; must convert stored income into money to exchange for the goods; east costly way of storing the retained income

### 2 Options

1. opportunity cost- keep all needed money readily available, but lose interest

2. transaction cost- keep all money in less liquid assets, but incur transaction costs; ATMs

-the optimal cash management plan will minimize these 2 issues

### 2. Precautionary Demand

-households cannot always plan the timing of their expenditures or income

-even if they know for sure what their nominal income, they cannot know what real income will be based on price changes

-so a buffer stock is sometimes needs; this buffer stock rises during periods of uncertainty

### 2. Firms' Demand for Money

-theory of transaction demand for money applies to firms as well

-firms have different cash management problems with regard to interest than households do however; there is a prohibition against interest payments on commercial accounts, thus raising the opportunity cost for firms

-firms also have a larger array of assets to choose from, and different conversion costs as well; they have capital and labour expenses, as well as "cash out" expenses for draining

their accounts; they thus hold larger precautionary balances when “cash outs” are more likely

-same opportunity cost v. interest costs as households however

### **3. Aggregate Money Demand Function**

-several factors influence demand for money

#### ***3 Factors Affecting Average Money Balances***

##### **1. scale of overall monetary expenditures during the payment period**

-price indexes are used to monitor inflation or deflation; CPI

##### **2. opportunity cost of holding money**

-interest foregone; will differ for firms and households

##### **3. transaction costs of conversions from stored income into money**

-this cost is a reflection of the technology of the economy’s payment systems; the rate of technological change in the payment system is a function of capital investment in the payment system; this is an endogenous choice made by firms that either process the payments or receive them; the investment decision is influenced by distortionary monetary policies and banking regulations

**\*aggregation-** generalizing the money demand function from these 3 variables to all households and firms

-generally firms and households have slightly different aggregation models, but since interest rates move together and such, they can even be combined into 1 aggregate monetary demand function

### **4. Estimating Demand for Money**

-the aggregation process is a simple way to estimate the behaviour of a large number of individuals from the predicted behaviour of 1 individual

-what the Federal Reserve uses when estimating the money supply; these statistical relationships are very important and monetary authority spends a lot of time monitoring them

-to estimate the demand functions, we must first choose a particular form; theory and experience indicate that a log-linear model is appropriate; use elasticities as the coefficients

$$\log M^d = \alpha_0 \log \beta - \alpha_1 \log r - \alpha_2 \log y + \alpha_3 \log P + \alpha_4 \log \sigma$$

-because good proxies for conversion costs and uncertainty do not exist, can be simplified to:

$$\log M^d = \alpha - \alpha_1 \log r - \alpha_2 \log y + \alpha_3 \log P$$

$\sigma$ = uncertainty due to business cycle fluctuations

$\beta$ = conversion costs

$r$ = opportunity costs

$P$ = aggregate price index

$Y$ = GDP

## 5. Demand for Real Money Balances

-theory is useful for identifying primary factors that determine the quantity of money demanded by the economy, and whether the elasticities associated with those factors should be positive or negative; theory is not helpful for statistical estimates however  
-issue is that statistical relationships change over time, due to: inflation, regulation, and financial innovations

**\*empirical facts**- those statistics that have remained unchanged; first empirical fact is that the price elasticity of money is 1, regardless of measure of money being used (M1, M2, M3); this is because the demand for money is based on the purchasing power of money; 1 1% increase in prices needs a 1% increase in money

$$\log (M^d/P) = \alpha - \alpha_1 \log r + \alpha_2 \log y$$

-log-linear model of the aggregate demand for real money balances ( $M^d/P$ )

## 6. Velocity

-the various measures of money can exhibit long-term trends

### 2 Reasons for Long-Term Trends

1. economic growth- aggregate demand rises with growth
2. technology- demand falls with technology for transactions

-secular changes can also result, such as: regulation or monetary policy; must segregate these secular changes from legitimate trends

-most common way to monitor trends in money demand due to the 2 principal causes is to use statistical analyses that allow them to be separated

**\*velocity of money, current income velocity of money**-  $V=y(M^s/P)$

-when the money market is in equilibrium the money supply = money demand, so demand can be substituted for supply

### 2 Empirical Facts

1. price elasticity of money is = 1
2. for most measures of money, the real income elasticity of demand for money,  $\alpha_2$ , is close to 1

-Marquis and Witt (1989); Mehra (1992)

$$V=y(M^s/P)$$

$$\log V = \log y - (M^s/P)$$

$$\log V = -\alpha_0 \log \beta + \alpha_1 \log r + (1-\alpha_2) \log y - \alpha_4 \log \sigma$$

-from the second empirical fact:

$$\log V = -\alpha_0 \log \beta + \alpha_1 \log r - \alpha_4 \log \sigma$$

-this equation is an alternative way to characterize the aggregate demand for money; it states that as the technology of the payment system improves, such that the transaction cost of converting liquid assets into money declines ( $\beta$  falls), the demand for money is also declining and velocity is therefore rising; as the opportunity cost of holding money falls, or as  $r$  decreases, the demand for money rises and velocity falls; finally, as the level of income uncertainty rises, such that  $\sigma$  increases, precautionary balances rise and velocity falls

-velocity is used to identify secular changes in the aggregate demand for real money balances, because: empirical fact 1 means that changes in real income due to long-term economic growth do not affect velocity; therefore, the only source of velocity of money must be technology, since there are only 2 fundamental trends in money demand; thus, as technology improves, the demand for transaction assets can be expected to decrease, which could lead to a secular rise in velocity; there is also no long-term trend in either the opportunity cost of holding money or the level of uncertainty about real income- this is reasonable because opportunity cost generally rises and falls with interest rate levels, and changes in real income ( $\theta$ ) tend to be mostly associated with business cycle swings with no tendency to rise or fall in the long run

-on a graph, if no secular changes were occurring, the velocity of money over time would show a pattern of fluctuations around some straight line, the slope of which is determined by the long-run effect of changes in the technology of the payment system

-M1 and M2 understandings are much more important in decision making than M3 and L

## **7. Secular Changes in Demand for M1**

-3 major periods of M1 velocity

### ***3 Periods of Velocity of M1 since 1961***

#### **1. 1959-1973**

-US dollar was pegged to gold standard; rule under which monetary policy had to be conducted; prohibited the Fed from adopting a high inflation policy for any protracted period of time; average inflation rate from 1959 to 1966 was nearly 0

-M1 contained all the economies transaction assets because of regulations; consisted of non-interest bearing accounts, but since inflation was 0, the assets were not losing value  
-households and firms therefore had to economize on their M1 balances, the result being a continual, gradual improvement in the efficiency of the payment system throughout the period; this resulted in a steady velocity increase of 3.5% over the 14 year period

#### **2. 1973-1980**

-framed by collapse of Bretton Woods Gold Standard, and DIDMCA looser regulations  
-monetary policy became discretionary after leaving the gold standard, and the Fed undertook high inflationary actions to reduce unemployment, resulting in double digit inflation in the late 1970s

-velocity of money increased at 4% during this period, with the secular change occurring around 1973 and the demand for real money balances grew more slowly during period 2  
-the principle cause of the secular change in money demand was the fact that incentives for households and firms to economize on their money balances was altered by the high inflation policies of the Fed; high inflation produced correspondingly high nominal interest rates on assets that could be held in lieu of M1 assets; so everyone looked for alternatives to avoid the high opportunity costs of M1 assets; technological improvements to electronic payment systems also resulted

-the secular growth in the demand for money fell and velocity grew more rapidly than in period 1, when inflation was roughly 0

-the fluctuations in velocity remained relatively stable during this period as well, suggesting that once the Fed understood a secular change had occurred and could identify

the new trend, the demand for M1 was still relatively predictable and could still be used for the purpose of conducting monetary policy

### **3. 1980-1994**

-velocity of M1 changed profoundly during this period; overall velocity fell, but the new trend is hard to identify because of the dramatic increase in the volatility of the velocity

-period began with passage of DIDMCA and phasing out interest-rate ceilings (completed in 1986)

-principal reason for the decline in velocity of M1 was the interest-bearing checking accounts; this drastically reduced the opportunity cost of holding M1; the dramatic increase in demand for M1 caused a corresponding decline in velocity

#### ***3 Reasons for Volatility During Early Period 3***

1. gradual phasing out interest-rate ceilings; opportunity costs of M1 could be adjusted with each phase

2. new money market instruments became available to households after deregulation, and commercial banks developed new instruments; with new product offerings came adjustments in households' demands for M1 assets

3. finally, in 1981 and 1982 the economy underwent its deepest and longest recession since 1933

-it coincided with a decline of more than 10% in inflation, and thus nominal interest rates, and induced an unusually large degree of income uncertainty; both of these factors tended to raise money demand, and, as suggested by the log-linear demand model of velocity, contributed to the decline in velocity in 1981-1982

-M1 became very unpredictable during period 3 and thus M1 became an unreliable definition for money for the Fed to use in its monetary policy; may regain its reliability, but will likely remain more volatile than it was in periods 1 and 2

### **8. Velocity of M2**

-in contrast to M1, the long-run trend in M2 velocity appears to be 0

-additionally, no secular changes can be clearly identified in the entire period from 1959-1991

-apparently, technological improvements in economy's payment systems did not affect the overall economywide demand for M2; this implies, the Fed may be able to rely on the long-run relationship between real M2 balances and real GDP, or equivalently nominal M2 and GDP to avoid the problem of systematically over or under supplying money to the economy when secular changes in the demand for money occur unexpectedly, as occurred in 1973 and 1980 in the demand for M1

-the changes in fund transfers in these periods, 1973-1980 and 1980-1991, were coming from non-M1 components of M2 to M2 components

-however, M2 is not a good tool for short-term policy, as it has significant short-term volatility; therefore, if the Fed is pursuing a short-term policy objective, such as full employment (policy objective generally associated with stabilisation or countercyclical policy), it is unlikely to be successful relying exclusively on M2 for policy objectives

-as a general rule, M2 has replaced M1 as the Fed's definition of money since the mid-1980s; the reason for the change was the erratic behaviour of M1 velocity in response to DIDMCA; phasing out of interest-rate ceilings and other provisions

- however, now many people are shifting their funds from M2 to stock and bond mutual funds among households; if this is permanent, M2 velocity will shift upwards; if it is temporary, M2 velocity will revert to its historical long-run mean
- therefore, the Fed is now left with no reliable monetary aggregate measure to guide its monetary policy actions; there has been a continual increase in M2 velocity since 1991
- the increase in the demand for currency has also been attributed to the underground economy

### **9. Other Velocity Measures**

- by varying the definition of money, we construct different volatility measures
- \***income velocity of currency**-  $\text{nominal GDP} / \text{nominal supply of currency}$
- by studying the velocities of different measures, we can find the best measure of unit for monetary policy
- velocity of currency has followed same path as M1, and M3 and L have similar abrupt changes
- old M1 follows M2; old M1 is currency plus demand deposits; but also shows same short-term volatility issues

# Stock and Bond Valuation and the Term Structure of Interest Rates

## 1. Household Preferences and the Required Return to Savings

- selection of assets once the money demand from income has been satisfied; and the implication of those selections for short-term and long-term interest rates
- as long-term assets are not concerned with liquidity, they are most focused on risk and return; every household has a different willingness
- as inflation affects the ex post rate, expectations of inflation must be included in the required return rate; in equilibrium the nominal rate (return) includes the expected inflation rate and the real rate
- \*term structure of interest rates**- short-term rates and long-term rates rising and falling inversely to maintain equilibrium
- \*expectations hypothesis**- we get a lot of information from the term structure of interest rates; changes in the term structure tell us about: inflation, risk, or performance of individual firms; related to the overall performance of the economy and signalling of macroeconomic conditions
- as the fundamental determinants of the investments change over time, so is the term structure of interest rates

## 4 Properties of Household Utility Function

1. higher level of consumption at any date will result in more utility at that date
  2. diminishing marginal utility in consumption
  3. risk aversion (individual differences)
  4. discounting future for present consumption
- some households experience diminishing marginal utility quicker than others; this related to the household's tolerance of risk and is known as degree of risk aversion
  - households also value utility received today more than utility received in the future; discount the future

## 2. Fisher Equation

- while the household is interested in real return on its assets, its income stream is in nominal or monetary units, or dollars
  - inflation will erode purchasing power over time, and so household must be compensated for expected inflation on an asset's future income stream
- $$R = r + \pi^e$$
- so as the investor's expectations of future inflation change, so will their required return or nominal interest rate

## 3. Bond Valuation

- 30 year Treasury bond is actually 60 semi-annual coupon payments



- the higher return the investor demands, the lower price he is willing to pay
- the price established the equilibrium rate of interest, which corresponds to the long-term interest rate, or yield, on government bonds
- there is an inverse relationship between bond prices and bond yields
- rising bond prices translate into lower long-term nominal interest rates and cheaper funds for the issuer
- higher interest rates means lower bond prices, because the new bonds have higher yields

#### **4. Stock Valuation**

- slightly more complicated valuation than for bonds
- shares of stock entitle the holder to the profits of the company
- any profits are either paid out in dividends or reinvested
- when a firm retains funds for reinvestment, it does so for the purpose of higher profits, which would allow it to pay out higher dividends in the future; therefore, a firm's share price today reflects the value of the future stream of dividends that the firm is expected to pay
- so, the sum of the PV of future dividends claims is the maximum price an investor would be willing to pay for the stock

#### ***2 Pricing Differences Between Stocks and Bonds***

1. stocks do not have a fixed maturity
  2. the investor does not know the nominal values of the dividends that the firm will pay in the future, and therefore must form personal expectations of them (g) dividend growth rate
- when the required return increases, the price of the stock decreases; this is because now more is needed in return on investment, so there needs to be more room to grow
  - when dividend growth rates rise, the price of the stock increases
  - increasing uncertainty about the future can cause the stock market to fall

#### **5. Bond and Stock Price Fluctuations**

- the rate of return on any asset reflects the liquidity of the market for the asset (how quickly it can be converted without penalty), and the level of perceived risk
- liquidity is determined by the markets the asset trades in is not likely to change rapidly; perceived risk may change abruptly on economic news or anything else
- bankruptcy is a primary risk for long-term bonds; usually this risk horizon doesn't change too quickly though; for short-term bonds capital losses are possible if sold prior to maturity due to inflation increases or increase in bond supply (interest rates rise and prices fall)
- risk is significantly higher for long-term stockholders than long-term bondholders; last claims
- funds fleeing the bond or stock markets is usually placed in short-term investments, such as money market mutual funds MMMF

#### **6. Term Structure of Interest Rates: Pure Expectations Hypothesis**

- investors will choose between short-term and long-term assets; when rates rise on one because of market conditions, investors will switch their money until an equilibrium is reached

### **3 Main Influences on Term Return Differences**

1. liquidity
2. risk
3. maturity

**\*term structure of interest rates-** relationship between rates of return on assets within the same risk class; ie, both bonds or stocks

-when short-rates are below long-rates, short-rates are expected to rise in the future; when short-rates are above long-term rates, short-term rates are expected to decline in the future

-future path of short-rates is incorporated into long-term rates

**\*expectations hypothesis-** theory explains the term structure of interest rates

### **7. Yield Curve**

-the yield curve is the graph of the plots of the different yields to maturities of bonds

-includes 3 month to 30 year government bonds

-for each yield curve, all assets must be within the same risk class (all government bonds are default free, so they are plotted together); maturity and liquidity is what separates the bonds on the yield curve

#### **3 Slopes According to Expectations Hypothesis**

1. upward- short-term rates expected to rise (typical)
  2. downward- short-term rates expected to decline (inverted)
  3. no slope- short-term rates expected to remain the same
- yield curve usually has no slope when differences in liquidity are ignored

### **8. Liquidity Premium**

-liquidity premium has an effect on the normal shape of the yield curve that derives from the pure expectations hypothesis

-in order to tie up your money for a longer time, you will demand extra compensation

-borrowers also want to borrow long; they do not want to have to roll over short term debt and risk financing increases due to short-term rate increases

-long-term rates consequently have a built-in upward bias

#### **Alternative Yield Curve Slopes with Liquidity Premium**

1. steep positive slope- short-term rates increase in addition to liquidity premium
2. normal slope- short-term rates stay the same; just liquidity premium reflected in slope
3. no slope- short-term rates expected to decline by the liquidity premium
4. steep negative slope- short-term rates decrease by an even greater amount (inverted yield curve)

-the yield curve is usually fairly flat over the 10 to 30 year horizon; forecasts of short-term rates beyond 10 years are imprecise and differences in the liquidity premium between assets both with distant maturities is 0

### **9. Interpreting the Slope of the Yield Curve**

-positive steepening of the slope usually is caused by: higher liquidity premium, upward revision of forecasts, or increases in real rates or inflation (Fisher Effect)

**\*inverted yield curve-** indicates a fairly sharp decline in short-term interest nominal rates; such steep declines are often accompanied by recessions; short rates are higher than long rates

-long-term interest rates usually decline in a recession, so inversion of the yield curve usually accompanies a rise in bond prices

# II. Fundamentals of Monetary and Financial Institutions

## Financial Intermediation

### 1. Financial Intermediation in an Island Economy

- the lending source is not the financial institution who produces the funds; the ultimate lenders are the net savers of the society who have surpluses of funds they want to invest
- the institutions channel funds throughout the economy from surplus to deficit to match anonymous borrowers and lenders
- financial intermediation can be costly, and can severely strain the economy if imprudent lending practices result in defaults
- all economies need them, although they are not needed; people could just go to other people to get loans
- but since we have them, they must perform significant services
- introducing money into a pure exchange economy resolves the basic trading friction that arises in intraperiod trade because of a mismatching of preferences that results in a lack of double coincidence of wants between trading partners
- by completely decentralizing trade, money effectively performs an anonymous matching of preferences
- when just trading perishable goods, financial intermediation is not needed, as perishable goods are not intertemporal in nature
- durable goods are intertemporal in nature, and as such trading frictions and missing markets can arise, which can then be solved by the introduction of financial intermediaries into the economy

### 2. Financial Intermediation and the Matching of Intertemporal Preferences

- trading frictions restrict intertemporal trade by causing credit or loan markets to be missing or incomplete; specialisation in the lending process helps reduce these inefficiencies and increase social welfare and utility

#### *2 Requirements for any Trade*

1. incentives
2. feasibility

- individuals can maintain current consumption and pledge future cash benefits from an investment to entice a lender to lend the funds; alternative to multiperiod saving to finance the durable goods

- searching for other individuals who have the durable goods needed can waste time; additionally, he may have to contact multiple lenders
- if the individual cannot secure all needed durable goods, he can not increase productivity and his and others' welfare will not increase
- the borrower needs the lenders most; the suppliers can still save

## **2 Issues with Savers not Disbursing Funds Efficiently**

1. oversaturate the market with their goods, depressing prices
  2. return is negative of inflation rate; less than from the borrower
- thus, intermediaries reduce search costs for both borrowers and lenders

## **Trading Frictions**

1. lender must give up consumption today, but he gets interest in return; intraperiod double coincidence of wants
2. project must be feasible and generate positive welfare
3. may need multiple lenders to get all goods needed; (parts or money); appropriate matching of preferences between the borrower and all suppliers
4. individual must be able to coordinate all trades effectively; if even 1 falls through, he may not be able to make any productivity gains
5. risk of default
6. monitoring costs associated with private information

- as long as interest payments received from borrowers exceeds interest payments owed to lenders plus withdrawals from deposit accounts, the intermediary remains solvent and credit markets that may have otherwise been missing are complete
- increases economic output

## **3. Risk Assessment, Agency Costs, and Uncertain Investment Projects**

- just as money perfectly decentralizes exchange markets for intraperiod trade, financial intermediation perfectly decentralizes credit markets for interperiod trade; performs anonymous matching of borrowers and lenders just as money performs anonymous matching of trades in perishable goods
- another trading friction that can arise from interperiod trade is the risk of default; can be due to either fraud or miscalculation of the borrower
- without private information, where the borrower and lender both know the same, this becomes an evaluation likelihood
- idiosyncratic risk will be exposed to both borrowers and lenders; individual lenders cannot diversify idiosyncratic risk well by themselves, but financial intermediaries can perform the function well and realize economies of scale in the process; this reduction in risk to the lenders results in more credit for borrowers, thus increasing welfare through a more efficient intertemporal allocation of the economy's resources
- contracts will often have provisions of collateralisation; this protects the lender and makes the borrower be more transparent

## ***Repayment***

1. borrower must incentive to repay
2. must be future line of communication maintained
3. borrower must need to borrow again
4. borrower could become anonymous or vanish

5. borrower then becomes wealthier at expense of lender

- the larger the network of lenders, the more bad credit risk the borrower is taking
- the lender be assess risk and determine how to allocate it between him and the borrower
- risk assessment itself is a costly process
- various loan arrangements can be used: full collateralization (borrower fully responsible) to profit-sharing (lender fully responsible)
- the borrower has the most information about his circumstances; he will withhold negative information
- withholding of relevant information from the lender creates agency costs, which makes risk assessment more difficult and increases the need for monitoring past and present activities of the borrower; monitoring costs rise as well as total costs and thus loans granted decrease

#### **4. Financial Intermediation and Risk Reduction Through Diversification**

- in the absence of private information, the borrower and lender will construct the loan agreement so as to allocate risk between them with respect to their relative tolerances for risk
- lenders are generally risk averse, so they require more interest and thus reduce profitability to borrowers; this reduces loans
- financial intermediaries reduce this risk through bundling of funds together; by issuing many loans they increase their chances that a certain % will be paid back
- all projects may have the same level of risk, but each has its own idiosyncratic risk; financial intermediaries can eliminate this idiosyncratic risk however

#### **5. Financial Intermediation and Delegated Monitoring**

- borrowers' private information introduces agency costs' into the risk assessment of loans; these costs manifest in need for monitoring costs
- higher the monitoring cost introduced by the trading friction associated with private information, fewer loans issued and less efficient intertemporal allocation of resources
- monitoring costs would be exponentially higher without intermediaries, as each lender would have to monitor each of its borrowers; economies of scale makes much more economic sense for the society as a whole

##### **Monitoring Tactics**

1. incentives to reveal private information- collateralisation
  2. credit history
  3. net worth of borrower; reputation
- intermediaries have great incentives to maintain accurate and complete credit history on its borrowers

## Financial Institutions

### 1. Financial Intermediation in Stocks and Bonds

- financial institutions have emerged in modern economies to perform financial intermediary functions
- many different types have emerged; depository institutions are the largest category, with commercial banks the largest subgroup
- many regulations govern their everyday operations
- the money and capital markets can be conveniently differentiated by the terms of the maturity of the financial instruments created and traded in those markets
- cutoff is 1 year for money and capital markets; exception is 2-5 year CDs
- bonds range in maturity from 10-30 years; stocks have infinite duration

#### Functions of Brokers

1. facilitate exchange
  2. portfolio management/monitoring
- to reduce the costs of managing individual household portfolios, mutual funds have emerged; allows for more direct control by the household; some new bond issues have similar features
  - all the forms and degrees of financial intermediation, whether through a broker or mutual fund, are available to facilitate the trades in the secondary markets
  - pension funds are similar to mutual funds, but with greater specialisation; focused on retirement aligned assets and has more contractual restrictions; have vesting provisions, get contributions from employers and employees
  - because of the failure of employer-managed pension funds to solve the basic intertemporal trading friction associated with preference matching, a market niche was created for firms that could specialize in intermediating such loans;
  - starting in 1970s, private pension funds sprung up, whereby firms could pay their pension expense directly to the private firm and they would manage the fund; reduced vesting requirements for pension eligibility
  - specialisation of pension funds allowed them to offer more services and enjoy economies of scale, thereby increasing social welfare
  - basic intertemporal trading friction associated with need to match preferences of borrowers and lenders that produced the pension fund market
  - buying stock or bonds is investing in the liabilities of the firm

### 2. Financial Intermediation of Depository Institutions

- depository institutions are a class of financial institutions that collect deposits of small savers and aggregate them into loans
- they resolve the intertemporal trading frictions associated with anonymous lenders and borrowers and enjoy economies of scale
- the investing preferences of these depositors is short maturity and low risk
- the deposits are liabilities to the institution; but they institution can insulate itself from idiosyncratic risk by offering demand NOW deposits to many different households

- the deposit level also represents the volume of loans the institution can service
- main concern for the institution is having enough funds to meet demand for withdrawals; results from illiquidity risk and default risk

### **2 Ways to Maximise Illiquidity Risk**

1. portion of funds is not loaned out; reserve %; inefficiency to the economy
2. specialise in loans with short maturity or with active secondary markets

### **2 Ways to Reduce Default Risk**

1. make low risk loans; short maturities and active secondary markets
  2. diversification/ tradeoff between specialisation and diversification
- defaults will still happen, so the larger the stock of loans, the safer the depositor's assets are
  - assets are created by the depository institution in the form of deposit liabilities
  - the household pays for high liquidity and low risk with low rates of return

### **3. Mutual v. Stock-Based Ownership of Depository Institutions**

- the stock of accumulated net interest income is wealth that the owners of the institutions have to reinvest
- most commercial banks and S&Ls are stock based; same dispersion of funds as other businesses; this insulates depositors from risk
- credit unions, mutual savings banks, and some S&Ls are depositor owned

### **4. Depository Institutions in the US**

- depository institutions play key roles in the smooth functioning of the economy's payment system and in the transmission of monetary policy changes to the overall economy
- an understanding of those aspects of the economy therefore requires some detailed knowledge of the specific markets in which these institutions participate, the regulations under which they operate, and the central decisions their individual managers must make to fulfil their functions in the economy as financial intermediaries

### **4 Regulated US Depository Institutions**

1. commercial banks
  2. S&Ls
  3. credit unions
  4. mutual savings banks
- regulatory distinctions between commercial banks and S&Ls are disappearing
  - commercial banks have highest deposits followed by S&Ls

### **5. Commercial Banking**

- the regulations of primary concern and reserve requirements, which give the Federal Reserve some control over the various forms of money; and capital requirements, which insulate bank deposits from risks associated with loan defaults
- the most liquid of a commercial banks' assets are its primary reserves, consisting of vault cash and deposits at the Federal Reserve

### **3 Deposits Types**

1. transaction deposits- demand deposits and other checkable deposits
2. savings deposits- passbook savings and MMDAs



### 3. time deposits- CDs

#### **Primary Reserves**

1. vault currency
2. reserves with the Fed
3. demand deposits at other banks

-no interest is paid on any account held by a bank for other banks; primarily for check clearing

-primary reserves earn no interest, and so banks try to minimize them; reserve requirements is 1 way for the Fed to control the money supply

-Federal law authorises the Federal Reserve to establish minimum reserve requirements (within prescribed limits) for selected groupings of bank deposits that must be met regularly by commercial banks

**\*bank reserves-** minimum quantity of reserves that must be at the Fed or as vault cash; anything over is excess reserves

#### **3 Accounts Fed can Impose Reserve Requirements**

1. all transaction assets
2. 1 category of CDs- nonpersonal time deposits of short maturity
3. Eurodollar deposits

-10% requirement for transaction assets; other 2 have 0% (used to be 3%)

-growth in the quantities of the deposits is reflected as growth in the various measures of money ; monetary aggregates

-control of total bank reserves leads to limited control of the money supply, and that in turn leads the Fed to select reserve requirements

#### **2 Weaknesses in Link Between Bank Reserves and Monetary Aggregates**

1. changes in households' preferences for how they want to hold their wealth; could be due to either changing economic conditions or new financial instruments

2. unpredictable fluctuations in the quantity of excess reserves held by banks

-when this link remains constant, the Fed can regulate the total supply of money by adjusting the stock of bank reserves in the economy

-even if there were no reserve requirements, banks would still hold some reserves to meet unexpected net withdrawal demands even though these assets generate no income

-there could possibly even be a scenario in which the numerical relationship between bank reserves and transaction deposits could be allowed to fluctuate as economic conditions alter the incentives for banks to hold reserves

-in order for reserve requirements to be effective, the Fed must choose reserve requirement ratios that are high enough to be binding; changing the rate to .1% would not change anything; banks would already keep these amount there, so their management practices would not change and the relationship between bank reserves and transaction deposits would be as variable as before; that is, the reserve requirement would not be binding

-the higher the reserve requirement ratios, the more carefully the bank monitors its excess reserves by attempting to keep them as close to 0 as possible

-the Fed has a tradeoff; it must maintain reserve requirement ratios that are high enough to ensure good monetary control, but not so high as to cause unnecessary welfare losses due to greater inefficiencies in the loan market

**\*reserve tax-** the loss interest income due to reserve requirements

- bank reserves holdings represent inefficiencies in intertemporal trading in the loan markets; the higher the ratios, the greater the welfare losses
- strict regulation; banks must file weekly reports with the Fed detailing bi-weekly compliance over the reserve maintenance period; the problem for banks is unexpected withdrawal of deposits; must cope for this by having excess reserves, otherwise they become reserve deficient
- alternatively, if the bank is reserves deficient, they can acquire additional reserves by selling assets or incurring additional liabilities
- assets used for this purpose must be highly liquid; US T-bill and bonds and government agency and municipal bonds

## **2 Losses Associated with Secondary Reserves**

1. forgone interest by having default free assets
  2. capital losses on sales if long-term interest rates rise
- other methods of meeting reserve requirements: secondary market for real estate and auto loans; immediate call provisions on commercial loans; not used often
  - since the 1960s banks have also increased their reliance on liability management techniques to meet their reserve requirements; with the lifting of interest-rate ceilings in the 1980s, banks can fight for business with explicit interest rate changes; not an efficient or reliable way to raise reserves on a short notice
  - \*federal funds market-** because of the idiosyncratic nature of deposit withdrawals, a market has emerged that allows reserve deficient banks to lend from banks with excess reserves; federal funds rate
  - this rate is extremely sensitive to economywide credit conditions, as it reflects the availability of reserves in the banking system as a whole
  - grown immensely since 1960; very efficient at allocating bank reserves among banks, keeping excess reserves for the banking system as a whole to a minimum
  - banks can also rely on nondeposit sources of funds, including bank repurchase agreements and Eurodollar deposits
  - if there is a net positive withdrawal for the period, all banks won't be able to meet reserve requirements by trading for other's excess reserves; they can either sell secondary assets or go to the discount window at the Federal Reserve
  - lender-of-last resort; this rate is the discount rate and is an administered rate that is set by policy, unlike the federal funds rate
  - as a practical matter, a bank can go to either the federal funds market or the discount window, although the Fed discourages excessive reliance on the discount window
  - as the federal funds rate and the discount rate represent the banks' cost of funds, these 2 interest rates, and the relationship between them, play principal roles in the transmission of monetary policy decisions to the rest of the economy

## **6. Loan Default Risk, Deposit Insurance, and Capital Requirements**

- this is a fractional reserve banking system
- the retained earnings and paid in capital represent the capital stock of the bank
- if people were worried the bank had depleted its capital stock due to defaults, a precarious situation would ensue in which a run on the banks remaining assets occur; once all the bank's assets were exhausted, the remaining depositors would lose their funds

-to preclude bank runs, the FDIC ensures bank deposits up to 250,000; insurance system is financed by premiums paid in by member banks and the fund is managed by an agency of the federal government

-without FDIC, depositors would have to perform monitoring of the banks, which would lead to agency costs attempting to get the financial intermediary's private information

-because of the insurance, risk shifts to the government; to reduce monitoring costs, the federal government has set up capital requirements that commercial banks must meet; they must maintain a minimum quantity of capital as a % of total assets

### **2 Ways Capital Requirements Monitoring**

1. larger quantity of bank capital, more defaults bank can incur

2. as stock of capital increases, owners incur smaller % of monitoring costs

-the greater the share of capital, the less interest received on it; therefore, the higher the interest rates must be charged on other loans, reducing total loans

-however, the government reducing their monitoring costs by imposing capital requirements causes inefficiencies in the loan market; the inefficiencies lead to welfare losses due to the reduction in the overall volume of intertemporal trades being intermediated

## The Money Supply Process

### 1. Reserve Aggregates

-the central bank can alter the money supply either by changing the reserve requirements directly or by adjusting the total volume of reserves in the banking system through open-market operations

-to the extent that there is a known mathematical relationship between the volume of bank reserves and the stock of a monetary aggregate such as M1, the Federal Reserve can effectively determine the economywide supply of that aggregate; however, such relationships are not completely predictable and perfect control over the money supply by the central bank is not attainable

-the Federal Reserve wants to control the outstanding stock of selected monetary aggregates in the US; same principles apply to other western economies with fractional reserve banking systems

### 3 Factor Limit the Feds Ability to Control the Money Supply

1. commercial banks hold excess reserves
2. households can choose the monetary aggregates or short-term financial assets they prefer; some of which are reservable bank deposits and some are not
3. the bank's ability to raise funds via so-called managed liabilities that include large time deposits and nondeposit sources of funds such as bank RPs; these sources allow banks to fund loans without relying on reservable deposits

**\*total reserves TR-** the sum across all banks of the first 2 items on the asset side of the bank's balance sheet: vault cash VC and deposits at the Federal Reserve FD

$$TR = VC + FD$$

$$VC = (1-f) TR$$

-where f is the fraction of total reserves the bank wants to hold at the Federal Reserve

$$TR = ER + RR$$

-required reserves are the volume of reserves the bank must hold in proportion to certain deposit liabilities (assets to the depositors): transaction deposits (demand deposits, other checkable accounts such as NOW) DD; nonpersonal time deposits (of short maturity) TD; Eurodollar deposits ED

-as a matter of policy, the Federal Reserve sets the fraction of the deposits that banks must retain in the form of bank reserves

$$RR = r_D DD + r_T TD + r_E ED$$

-rd, rt, re: reserve % set by policy

-the bank must decide how much excess reserves to hold: it may keep ER to avoid having to incur the costs of borrowing funds or liquidating other assets on short notice to meet reserve requirements whenever there is an unanticipated withdrawal of deposits; alternatively, reserve requirements simply may not be binding, the bank may need more than is legally required for day-to-day operations

$$ER = e(TR)$$

-where  $e$  represents the fraction of total reserves held in excess

$$RR = (1-e) TR$$

-when banks are short, they must borrow on federal funds market or use the discount rate

### **2 Methods to Discourage Discount Window Usage**

1. discount rate is an administered rate set by the Federal Reserve as a matter of policy
2. Fed applies administrative pressure in banks it deems to be abusing the privilege; can be effective considering the extensive regulatory authority that would enable the Fed to micromanage banks if it chose to (seldom does)

-banks are permitted to carry over reserve surpluses and deficits from 1 period to the next; large banks (bound) with assets over 1 billion, always prefer to keep reserves below the minimum required; many smaller banks willingly hold excess reserves

-for a given maintenance period, any number of banks will have borrowed at the window; the fact that incentives for banks to borrow at the window changes over time suggests another useful way of dividing total bank reserves

$$TR = NBR + BR$$

-BR are borrowed reserves from the Fed; NBR are not

-a comparison of borrowed to nonborrowed reserves is considered by some to be a useful measure of how tight or loose credit conditions are for the economy as a whole

-the argument is that a large positive number for net free reserves NFR suggests that banks are holding excess reserves without having simultaneously incurred temporary obligations to the Federal Reserve through discount window borrowings, and thus are more likely to turn those non-interest-bearing assets into loans

$$NFR = NBR - BR$$

### **2. Federal Reserve's Balance Sheet**

-as the central bank, the Federal Reserve differs from commercial banks in that it can supply liquidity to the economy

-commercial banks are limited in supplying liquidity by the total quantity of funds available to them; this total is determined primarily by their deposit bases, but includes managed liabilities; also, reserve requirements limit the banks' ability to leverage certain of their deposits into loans

-a central bank with authority to operate the printing press for fiat currency has no limitations; it expand the nominal quantity of money and credit in the economy without limit; the fact that supplying money in excess of the economy's liquidity needs will cause inflation places an upper limit on how rapidly the real money supply can grow

- the Federal Reserve attempts to regulate the stock of money in the economy by supplying reserves to the banking system in managed quantities and by supplying currency on demand
- the largest liability on the Fed's balance sheet is Federal Reserve Notes; they comprise the nation's fiat money, and along with minted currency, make up the currency
- the second largest liability is deposits of depository institutions FD which along with VC make up bank's total reserves
- other deposit accounts are those of the US Treasury Department (checking account for US government) and of foreign governments and international organizations
- the Federal Reserve keeps track of the quantity of assets it possesses that are "held" as collateral against notes: gold, SDRs (IMF), and that portion of its US government and US government agency securities needed to equal the amount of notes outstanding; the notes are therefore 100% collateralized
- on the asset side, the main asset is US government securities; by some measures the US government debt market is the largest in the world, and the Federal Reserve owns 8 – 10% of the debt obligations
- second most important asset is loans to depository institutions; also related to monetary policy; include short-term borrowings at the discount window; reserve aggregate BR
- also includes: coin, minted by the Treasury and provided to the Federal Reserve to member banks as a service; cash items in the process of collection, or uncleared checks, reflecting the role of the Federal Reserve in the nation's check clearing system
- gold, SDRs, and foreign exchange also, which are available for use in the international settlement of accounts resulting from international trade or for use when the US government intervenes in the foreign exchange markets to influence the value of the dollar
- finally, the debt obligations issued by federal agencies other than the Treasury Department
- the Federal Reserve competes with private clearinghouses for this business; the latter has grown significantly over the last 15 years, but the Fed continues to receive the largest share of the market

### **3. Open Market Operations**

- when the Fed wants to change the money supply, or more specifically the stock of 1 of the monetary aggregates in the economy, it buys or sells US government securities in the open market
- buys securities to increase money supply, increases quantity of bank reserves in the economy, and eventually leads to an increase in the monetary aggregates; sale has the opposite effect

#### **3 Primary Questions**

1. with whom is the Federal Reserve dealing with; potentially very large transactions, so who gets this quasi-government business
2. what is the sequence of events that eventually causes a bond purchase by the Federal Reserve to raise the money supply, regardless of how we choose to measure money
3. how much does the money supply increase for each dollar of US government securities that the Federal Reserve purchases and how predictable is that figure

- open market operations are conducted in a single room in the Federal Reserve Bank of New York; a desk manager is in charge of the operations and has some discretion in structuring the purchases in terms of the quantity, maturity, and timing of the securities to be bought and in the selection of the seller; these decisions must be consistent with broad guidelines that are policy directives from the FOMC, which is one of the policy-making arms of the Federal Reserve System
- the desk manager determines who the Fed's counterparties in the transactions should be
- nearly all of the Federal Reserve's open market operations are conducted with authorised primary government securities dealers; a government securities dealer is essentially a private firm that manages a portfolio of government securities and is a market maker in the particular issues of government securities (differ by date of issue and maturity) that it holds in its portfolio
- as the market maker, the dealer has bid and ask prices and is willing to buy or sell any time; very low spread for the dealers of government securities; low default risk
- can be either secondary or primary government securities dealers; to be a primary, only 39 of them, must meet 3 criteria: capitalisation, expertise, and capacity; this purpose is to ensure that the Fed can engage in large transactions with the firms without the fear that they will be unable to complete them competently; the firms must maintain a minimum level of capital, provide current information on market activities, and both participate in open market operations and underwrite Treasury securities when new issues of government debt are brought to market through public auctions
- these are very large financial firms, commercial banks, and brokerage houses
- when choosing between authorised GSD when making an open market purchase of government securities, the Fed looks at the ask prices; the Fed has people who continuously monitor the dealers' bid ask spreads for selected issues
- these people continuously monitor so they can act quickly if they have to and to maintain integrity in the system and to look for best deals; usually multiple GSDs are needed

#### **4. Relationship Between Open Market Operations and Total Bank Reserves**

- many of the transactions are done electronically today
- the Fed buys 10 billion in bonds, and gives check; the check clears back to the Fed (one advantage to controlling the printing press is that you can always honour a check)
- this involves a sequence of transactions with Fed, commercial bank, and GSD; the money eventually stays in the commercial bank's FD with the GSD getting a credit (increase, liability for bank) to their deposit account
- this 10 billion raises bank reserves by an equivalent amount; the bank's RR increases by 1 billion, and the FD of 10 billion can now count towards the TR needed

#### **5. Multiple Deposit Creation**

- GSD's bank has 2 options to use the funds: expand its loan portfolio or reduce liabilities, or both
- the growth of the money supply will depend on how the money is distributed if it is used to expand the loan portfolio
- 3 options: cashier's check, demand deposit or NOW account balance will be raised, or cash will be given; depending on if those funds are put into investments that have reserve

requirements, the amount of money available can vary widely; 8.99 billion after the first dispersion, could go up to around 50.5 billion

-equations

### **6. Reserve Aggregate Multipliers**

-the Fed wants to use money supply to exercise control over the monetary aggregates M1 M2; rather than attempting to control the money supply directly, it may choose to regulate the outstanding stock of 1 of the reserve aggregates

-the usual choice is either nonborrowed reserves NBR or the monetary base MB; to decide how rapidly the reserve aggregate should grow to achieve a certain monetary growth rate, it estimates the relationship between the reserve aggregate and the selected monetary aggregate; therefore must determine the relationship between an open market operation and the stocks of nonborrowed reserves and the monetary base

-equation for NBR

-equation for MB;  $MB = TR + C$ ; interest in this aggregate is because the Fed can control its magnitude exactly if it chooses, because it represents the bulk of liabilities on the Fed's balance sheet; monetary base is known as high powered money

-obtaining the monetary base multiplier for an open market purchase  $mMB$ , is analogous to obtaining the multiplier for NBR when banks choose to expand their loan portfolio

### **7. Money Multipliers**

-when the Fed seeks to control the supply of money in the economy, it is explicitly seeking to control the stock of 1 of those 2 aggregates, M1 and M2

-therefore, the Fed needs to estimate the amount by which the money supply will change in response to an open market purchase; the Fed usually separates this relationship into 2 sequential links between open market operations and the money supply

#### **2 Questions**

1. how much does a particular reserve aggregate change in response to the open market purchase
2. how much does the selected monetary aggregate change in relation to the change in the particular reserve aggregate

-first relationships already derived; second set of derivations consists of M1 and M2 aggregates for NBR and MB

-equations

-equations

### **8. Sources of Imperfect Monetary Control**

-if all the values of the multipliers just derived were known with certainty to the Fed it could exercise perfect control over the nominal money supply in the economy, M1 or M2, provided the banks don't actively manage their liabilities

#### **4 Ratios Fed Needs to Know**

1. currency-deposit (c)
2. liquid asset to transaction deposit (a)



3. excess reserves to total reserves (e)

4. required reserves ( $r_D$ )

-only the required reserves ratio is known, as it is set by the Fed as a matter of policy

-households choose (a) and (c) when they make their money market portfolio decisions and commercial banks choose (e) when selecting their reserves position; all 3 ratios vary over time and in unpredictable ways

-therefore, in its attempts to monitor the money supply, the Fed can only estimate those 3 and use those estimates to guide its open market operations

-actually, (e) is the most stable and therefore the most predictable; banks typically hold less than 1% of total assets in the form of excess reserves, which corresponds to an (e) value of 2% to 3%; here, (e) is 2.9% and excess reserves are .58% of total assets for the banking system as a whole; fluctuates every week, but is usually stable over the course of 1 to 2 months; this means short-term control of the money supply may be problematic, but long-run is not a major problem

-(c) and (a) are greater issues for monetary control; here we get  $C = 166.8$  billion,  $DD = 425.7$  billion, and  $LA = 1,897$  billion; ratios of (c) = .392 and (a) = 4.456, typical numbers; however, they vary slightly more week to week than (e)

-averages of these numbers over 4 to 6 months can exhibit significant drift, up or down; they are significant enough to effect Fed's control over M1 or M2, but reveal behavioural changes on the part of commercial banks, households, and firms of which the Fed must be mindful if it is to avoid unnecessary monetary control errors that adversely affect the economy

-week 2 week periods is when these ratios are most commonly calculated

-even perfect control over 1 or more of the monetary aggregates would not ensure a successful monetary policy, because success also requires a predictable link between changes in the monetary aggregate of choice and real economy; much for difficult problem for policy makers

### **9. Endogenous Money Supply**

-if exogenous events cause output to rise, the greater output stimulates the economy and commercial banks experience an increase in loan demands; the Fed could increase bank reserves or banks could spend excess reserves; either way, deposits increase and money supply rises

-another option for commercial banks is to increase their reliance on managed liabilities; they could raise funds by issuing overnight or term RPs, or more aggressively marketing large time deposits by raising the interest rates on them (managed liabilities are included in M3, but not all are in M2)

-although the Fed could reverse the increase in loadable funds or deposit base with appropriate open market operations, assuming that (c), (a), and (e) remain fixed, banks can alter the money supply slightly by shifting their reliance toward managed liabilities

-suggests a mechanism where the economy is able to generate liquidity without the assistance of a Fed policy designed to alter the availability of bank reserves; an endogenous response by banks to shocks that originate in the real sector of the economy weakens the effectiveness of monetary policy

-volatility of excess reserves is not an issue over along period of time

-most troubling for the Fed is household's shifting funds between reservable deposits and nonreservable deposits or even monetary assets outside of M2; these have happened before, and to the extent that the adjustments are unpredictable, monetary control is impaired

-an endogenous money supply response by the banking system is likely to affect the monetary aggregates M1, M2, and M3 differently, and thus may compound the monetary control problem of the Fed- commercial banks can create money themselves

## Institutions of Monetary Control: Historical Role of the Federal Reserve in the US

### 1. Problem of an Inelastic Money Supply

-Fed was created by an act of Congress 1913; has 2 roles: principal regulator of depository institutions and principal architect of nation's macroeconomic policy; 2 roles are not completely independent

-ability of the Fed to affect the real economy through monetary policy decisions is derived in part from its regulatory authority- binding reserve requirements; conversely, its role as regulator to ensure safety and soundness of nation's financial institutions can be affected by changing economic conditions; this interdependence is best understood through the role of the Fed in the money supply process

-the Fed's mission is different than what it was in 1913; it is always changing in its impact on the money creation process

**\*lawful money, 1913-** consisted of gold and silver coins, representative commodity money in the form of gold and silver certificates (backed 100% by the gold and silver holdings of the Treasury Department); national bank notes also circulated as currency- issued by nationally chartered banks and backed by holdings of US government securities held by those banks on deposit at the Treasury Department; fully redeemable for gold as well; today's Federal Bank notes did not exist

-firms, unlike households for the time, relied heavily on interest-bearing checking accounts for their business transactions; commercial banks were required to hold reserves against a fraction of those deposits in the form of gold and lawful money; therefore, an upper limit on the supply of money was fixed, unless there were changes in either the currency-deposit ratio or the ratios of deposit accounts with different (positive) reserve requirements; essentially, the federal government could not fire up the printing press to increase the money supply

-therefore, when reserves consist solely of gold and lawful money, the stock of money is determined by the stock of gold and silver acquired by commercial banks or the Treasury, and introduced into the economy as commodity or representative commodity money; some New York banks at the time actually had accounts that could be included as reserves; very limited

-lawful money and therefore reserves could only expand through new gold discoveries or inflows of gold from settling international payment accounts; in practice however, most banks held excess reserves as well to meet liquidity needs of their business customers, which was subject to business-cycle and seasonal fluctuations

### 2 Problems with Money Creation System

1. no formal mechanism to control prices

-gold prices were fixed to other commodities, so new gold supplies or reserves would affect prices of other commodity goods, and hence the price level; connection between bank reserves, money supply reserve, and price level was not understood until after WWI

2. inelastic response of the supply of reserves to business-cycle and seasonal fluctuations in money demand

-this inelasticity exaggerated periods of credit expansion and contraction and induced larger swings in real economic activity associated with the accompanying fluctuations in money demand; banks did not hold excess reserves for this, but obviously lost interest on them; problems persisted for contractionary and expansionary times; no deposit insurance so bank runs drained reserves during contractionary times; bank runs of 1893 and 1907 led to the call for a more elastic money supply, and the Fed was created

-money privately issued by commercial banks largely vanished due to a stiff tax imposed in 1863 that effectively rendered them uncompetitive with national bank notes issues by the Treasury Department

-reserve requirements differed among states for state chartered banks, and across categories of nationally chartered banks; both in terms of reserve ratios and the classes of deposits requiring reserves; some state statutes were also ambiguous on whether or not national bank notes could be considered legal reserves

-fluctuations in the demand for gold can lead to inflation as well; when there were massive inflows of gold during WWI and WWII for military financing, inflation was rampant as well because of the massive influx of gold, relative to other economies

-some say proper management of gold reserves could accomplish elasticity of the money supply; Federal Reserve notes did not necessarily provide needed elasticity during this period

## **2. Endogenous Money Supply**

-Fed act 1913 established 12 regional autonomous banks governed by a central Federal Reserve Board; the regional banks offered membership to commercial banks in their district

-federally chartered banks were required to be members of the federal reserve; but they were free seek a change in their charter through application to their state banks; many availed themselves of this

-the commercial banks were required to put up capital in the form of gold and gold certificates in rough proportion to their size to establish the initial operating capital of the Fed; they were effectively owners of the Fed, and received dividends corresponding to low fixed rate of return from profits from Federal Reserve operations; eventually, excess profits were remitted to the Treasury; these profits enabled the federal government to engage in inflationary finance of its gross expenditures

-commercial paper was purchased by member banks to re-discount to their district bank by virtue of Federal Reserve membership; the Fed issued either bank notes or credited their Fed accounts; to the extent that this infusion provided ER over RR, the bank could now increase the money supply with money creation multiplier; however, as the commercial paper became due, the banks would have to repay the Fed (self-liquidating expansion of bank reserves); money supply and bank credit therefore increase from firm issuing commercial paper

-the system produced an elastic, endogenous money supply that accommodated fluctuations in money demand; monetary policy did not consist of an exogenous determination of the optimal volume of money and/or credit in the economy, but rather how the endogenous response of the money supply ought to be implemented

## **2 Objectives of Monetary Policy 1913**

1. ensure high quality of commercial paper that was being rediscounted
2. regulate the degree of elasticity of the money supply by adjusting the rediscount rate; the higher the rediscount rate, less credit and more inelastic money supply
  - commercial paper is an important indicator of business cycles, as its need fluctuates with business activity; therefore, it is an important economic indicator, and thus can be used as an endogenous money supply determinant
  - beginning in 1959, the Fed allowed member banks to meet reserves with any combination of FD and VC
  - at this time, the Fed was switching out the national bank notes with Federal Reserve Notes

## **3. Unintended Consequences of Open Market Operations: 1917-1921**

- Fed was envisioned for the nation's interest, but was also suppose to be privately owned by the commercial banks in the districts; membership was not required (although most joined), the goal was to entice banks to join the Federal Reserve System in their own accord by offering them a modest return on their capital investment in the Fed and by providing valued services such as check-clearing, and most importantly, access to reserves to meet short-run demand fluctuations
- the banks were not intended to profit-maximising institutions and therefore not attractive investments
- to achieve that goal Fed Banks were given a lot of autonomy; they were authorised to engage in asset management as seemed prudent to maintain adequate reserves against the principal liabilities (Fed Notes and member deposits), while also managing the investment funds of their owners, the member banks; they had latitude to purchase and sell private-sector securities in the open-market; initially trading of government securities was not intensive, although it was allowed; this is because in relation to monetary policy, open market purchases and sales were primarily private-sector, because the purpose of the trades was to make effective the rate at which commercial paper was being rediscounted by the Fed and thus establish the desired degree of elasticity of the money supply process; they could purchase the commercial paper themselves if the banks did not want to; this action was not common
- to ensure prudence, each Fed Reserve Bank was required to maintain minimum gold reserves of 40% against Fed Notes in circulation, and 35% against member bank deposits; in reality this wasn't binding, and when Congress threatened to make it binding in 1945, the minimum required was dropped to 25%

## **2 Results from WWI Intervention for Central Bank Policy**

1. massive inflow of gold to US from Europe; resulted in massive inflation because the Fed increased the Fed Notes in circulation to response to the amount of new gold to restore the old gold price, as the dollar value of gold had become depressed; this raised the amount of Notes in circulation and thus raised the price level
2. increase in amount of US Treasury securities issued by Treasury Department; much debt issued to finance post-war reconstruction in peacetime economy in US and abroad; a large volume of these went to commercial banks and 12 Fed Banks

-by 1919, a theory had emerged that the inflation in the economy was not due to the gold inflows and the gold standard, but to the presence of US government debt in the portfolios of commercial banks and the Federal Reserve

-this was because the elasticity of money supply was based on the premise that the Fed was intended to provide elasticity of the money supply; as business activity increased, commercial banks would simply discount more commercial paper via the elastic response of central bank reserves; government debt was thought to interfere with this natural process; therefore, the solution to inflation was thought to be purging the government debt from the portfolios of the commercial banks and the Fed, and shifting it to the savings portfolios of the public

-the Fed's gold reserves were more than 70% of Federal Reserve Notes and member bank deposits; the Fed had been offering low interest loans to member banks to assist them in meeting established quotas in their US government debt holdings, and in extending credit to households to enable them to purchase government debt

-the Fed began selling government securities to the public; households withdrew down their balances and commercial banks reserves contracted; commercial banks called in banks to meet reserve requirements, which reduced the volume of credit in the economy and led to further declines in the money supply; this led to the severe recession of 1920-1921; inflation did come down however

-Fed's link to open market operations and credit volume was not understood in 1919; the main reason for the end of the recession was not a subsequent reversal of the Fed's open market operations, but concern was for the Fed's profits not the health of the economy; the Fed was losing money from selling their interest-generating asset (US debt), but also were losing income from commercial paper discounting, and were being left with increasing % of assets in the form of gold, thereby impairing their ability to pay dividends to their member banks; they then reversed their policy again and began buying government debt by issuing Fed Reserve Notes,; that led to an expansion of money and credit, and by the end of 1921 lifted the economy out of recession

#### **4. Centralisation of Monetary Policy Decision Making: 1921-1935**

-as WWI loomed as the Fed realised that they would have to play a large role in US financing, they established a separate committee to investigate, Council of Governors, which in turn established another committee Open Market Investment Committee to specifically conduct open market operations; this was not allowed in the Fed Reserve Act, it indicated that their actions should be directed by the Federal Reserve Board; this committee, and not the Federal Reserve Board, directed open market operations

-in the 10<sup>th</sup> annual report of the Federal Reserve in 1923, the relationships between open market operations and available credit were officially acknowledged and the relationship of open market operations to the price level; the experiences of post WWI business cycle altered the Fed's view to open market operations, although not instantaneously

-in the 10<sup>th</sup> report, the Fed interpreted its mandate more broadly to include for the first time: determining the volume or quantity of Federal Reserve credit outstanding and not merely ensuring the quality of the paper that it was discounting and determining the elasticity of the money supply process; quantity v. quality; this new mandate opened the possibility of the Fed to engage in an active countercyclical policy designed to passively smooth out business cycles, in contrast to its original mandate of passively

accommodating fluctuations in money demand with an endogenous elastic supply of Fed Reserve credit

-Governor Strong led counter cyclical policy moves from 1923-1927; on his death, no single leadership emerged, and by 1930 the name had changed to the Open Market Policy Conference and included all 12 member banks; many members opposed Governor Strong's policies, and internal dissension led to substantial weakening of the group as the Fed's primary policy-making entity

-Fed Reserve Board began to exert greater influence over the open-market committee through its power of review, and the diffusion of responsibility for setting policy, along with an inadequate understanding of the influence of open market operations on the real economy, has been blamed for the succession of blunders that turned a mild recession into the longest period of sustained negative economic growth in the US economy's history; the sharp contraction in the US spread overseas and led to WWII

-the Fed contracted the money supply by more than 1/3 between 1929 and 1933 with open market operations; this continued unabated, even as the economy was suffering

## **2 Official Reasons**

1. desire to stem speculation in the securities markets; excessive speculation was believed to be the reason for the stock market collapse; after, banks beefed up reserves and share of assets in government securities, thus halting lending and credit; the Fed exacerbated problems by tightening credit further by selling securities in the open market, as many banks exhausted their large reserves to purchase the securities leading to a liquidity crisis and bank closings

2. departure of Britain from gold standard; followed by a series of runs in Europe on the pound for conversion into gold; this was thought to follow to the US; there were massive gold outflows from the US, so the Fed reduced the dollars in circulation to maintain the dollar value of gold; that process was followed by large open market sales of government securities that further restricted credit; as the economy grew weaker and banks closed, households rushed to banks to withdraw their money, leading to bank holidays and dramatic banking reform

-some feel that the poor policy decisions of the Fed on adherence to the gold standard, but some have argued that the world financial system was simply very fragile and the Fed's contractionary policies precipitated a worldwide contraction that was likely anyways

-the Fed misviewed the banks' large reserves; they felt that large reserves meant slack loan demand, but the banks were just hoarding cash

-some feel that the US gold reserves were actually large, and there was no reason for the Fed to engage in open market operations, as their reserves could handle any speculative purposes

-Banking Act 1935- new banking legislation included: FDIC, Federal Home Loan Banks, and separation of investment and commercial banking; the Federal Reserve was drastically overhauled as well, the title's were changed from governor to president, and the Fed was more centralised and the decision makers were placed under greater government control; authority shifted to the Federal Reserve Board, from the Board of Governors of the Federal Reserve System; open market Policy Conference was dissolved, and replaced by 2 groups

1. Board of Governors- located in DC; 7 people to 14 year terms; chairman and vice chairman got 4 year terms; the governors have broad powers to set the discount rate, within limits the reserve requirements at banks, and the authority to veto the Federal Reserve Banks' implementation of policy decision and selection of District presidents
  - length is to ensure insulation from excessive political influence in policy deliberations, staggered is to prevent 1 administration from appointing many; not worked well as average tenure is only 7 years; no 2 from the same district
  - they were authorised to effectively double reserve requirements, although not uniform across all member banks; imposed upper limit of around 25%
2. Federal Open Market Committee FOMC; replaced OMPC; the 12 members have the mandate to determine the open market operations of the Fed; chairman, 6 governors, NYC bank president, and 4 other bank presidents; all open market operations, as well as foreign exchange market transactions of the Fed are conducted in New York; the autonomy of the 12 original Fed Banks envisioned disappeared; membership by commercial banks in the district became symbolic
  - the new policy reflected a greater concern for macroeconomic stability, and the centralisation of policy making shifted the focus of policy away from regional banking concerns and toward ensuring safety and soundness of nation's banking system as a whole

### **5. Gold Purchase Program and Treasury Department Dominance: 1933-1937**

-this centralisation of decision-making authority coincided with a weakening of the institution's role in formulating monetary policy; it became a passive agent of the Treasury Department; these decisions effectively determined the nation's monetary policy the first few years of the post-1933 New Deal Era

#### 3 Reasons for Subordination

1. failure of the Fed to mitigate the 1930 business-cycle contraction, which led to the Great Depression
2. Keynesian economics- fiscal policy more important than monetary policy
3. no strong leadership after Strong; indecision and drift that affected official policy decisions

-the Treasury's involvement began in 1933 when president Roosevelt, under the Emergency Banking Act announced that the US would embark on a deliberate policy of domestic price inflation that would be initiated by a devaluation of the dollar against foreign currencies; was to stimulate domestic production by increasing exports, decreasing imports, and achieved by increasing the dollar price of gold; primarily concerned with exports of US agricultural products and raw materials, which had declined

#### **4 Aspects of Roosevelt's Plan**

1. reduction of gold content of dollar; cut by as much as 50%
2. nationalisation of gold; all private holdings, including gold bullion, coins, and certificates, including those of commercial banks, were to be relinquished to the Fed and Treasury by Jan. 17<sup>th</sup> 1934 for 20.67 per ounce; gold was selling at 33 per ounce on that date; private holdings were limited to small amounts needed for industrial and artistic use and to collections of rare coins with numismatic value; individuals were permitted up to 100 per person, which was revoked by Gold Reserve Act 1934



3. gold embargo to preempt the flight of gold out of the country  
 4. massive gold purchase program undertaken by the Treasury Department; the Fed's passive compliance of the gold purchase program is what effectively placed monetary control in the hands of the Treasury Department; success of the program is debatable; the increase in the gold purchase program because of the devaluation of the dollar tended to produce the desired effect on the trade balance; but pre WWII sabre-rattling led to a flight from Europe of capital and the demand for US dollars increased and lessened the effect of the trade balance

-under the Gold Act 1934, official dollar price of gold was fixed at 35 per ounce; to support this price, the Treasury agreed to purchase any gold offered to it, and restricted gold sales to international settlements; this devaluation produced large paper profits for the Treasury, which had gold valued on its books at 20.67 per ounce; the profits supported a stabilisation fund to support the gold purchase program; the Treasury would pay for gold by drawing against its deposit balance at the Fed, with a portion of these funds circulating back into the economy through deposits at commercial banks and a portion showing up as currency in the form of Federal Reserve Notes outstanding, thereby increasing the money supply; the Treasury Department then replenished its Fed Reserve account balance by issuing gold certificates to the Fed, which would credit the Treasury's balance; thus, there was a reduction in public gold, and an increase in supply of Federal Reserve notes outstanding, thus leading to a devaluation of the US dollar in relation to foreign currencies

-the effect on the money supply of deposits v. currency is different' deposits raise the money supply by more because of the money multiplier in a fractional reserve banking system; countries that stayed on the gold standard would appreciate (deflate) in relation to nongold commodities; most countries abandoned the gold standard (French franc)

-the Fed could have nullified the Treasury's gold purchases by engaging in offsetting open market operations; when forced to raise the Treasury's deposit account by buying gold certificates, it could have sold securities on the open market; it would have kept bank reserves at the same levels, and precluded the commodity price inflation and the corresponding US dollar devaluation that the gold purchase program was intended to achieve; this sterilisation was performed, but not by the Fed; in 1937, the Treasury thought some of its gold sales were expanding bank reserves too rapidly, so it therefore financed the purchases by issuing government securities, which negated the effect on the volume of total bank reserves; thus, the Treasury was acting as the nation's monetary authority

### **6. Unintended Consequences of Reserve Requirement Changes: 1937-1938**

-in the years after the onset of the gold purchase program, the Fed relinquished the use of its principal policy tools for monetary control- discount rate and open market operations- to the Treasury

-is gained a new tool under the Banking Act 1935; reserve requirements, and it made quick use; also allowed the Fed to regulate interest rate ceilings on selected deposit accounts at commercial banks; per SEC act 1934, the Fed was allowed to set margin requirements for loans for securities purchases

-banks began to accumulate large excess reserves due to the large gold inflows for precautionary reasons; the Fed incorrectly viewed this as slack loan demand and feared

banks would begin promoting speculative loans; recent issues were still on the mind; against the recent backdrop, these large reserves were seen as potentially dangerous and warranted an active policy designed to absorb the excess liquidity they were perceived to represent;

- to achieve that goal, the Fed engaged in 3 successive changes in reserve requirements to absorb the excess liquidity that effectively doubled the reserve requirements; the policies were so severe that they induced an outright contraction in the volume of money and credit in the economy and precipitated the recession of 1937-1938; similar to the Fed's first active use of open market operations to purge government debt from portfolios of commercial banks and the Fed, its first active use of reserve requirements in 1936-1937 to absorb excess liquidity had a much greater influence on the real economy than it had anticipated; this restrictive monetary policy coincided with the onset of the sterilisation policy of the Treasury's gold purchase program, which minimises the effect of gold inflows to the US on the domestic money supply

- the discount rate was significantly above market rates during this period, so commercial banks reduced their reliance on it

### **7. WWII and US Government Bond Price Support Program: 1939-1945**

- economic rebound occurred in 1938, mainly because of WWII; these events were accompanied by large gold inflows, just as prior to WWI, both for war materials from the US and to escape the uncertain European investment climate; the Treasury did not sterilise these purchases, which caused a large increase in the domestic money supply and subsequently in the price level

- after entering the war in 1941, the Treasury issued more debt; in order to not depress prices and raises interest costs for the Treasury, they bought some government debt of varying maturities on the open market to keep interest rates down; in the interest rate pegs (ceilings) were adjusted upward as inflation rose

- these adjustments were advocated by the Federal Reserve and reluctantly agreed by the Treasury, to whom the interest payments and excess profits were remitted by the Fed; gold inflows slowed, but the money supply continued climbing as the Fed's open market operations increased reserves and continued high inflation that had been attributed to gold

- this monetization of the debt was the mechanism of inflationary finance of the war; again, the fiscal decisions of the Treasury Department and not the monetary considerations of the Federal Reserve determined the nation's monetary policy

- much of the inflation associated with monetising the government debt issues used to finance the war did not actually set in until after the war had ended; part of this was because of post-war price surges by consumers, reflected by a sharp increase in the deposit/currency ratio, which had a multiplier effect on the money stock

### **8. Treasury-Federal Reserve Accord: Truce and Settlement, 1945-1952**

- US government bond price support continued after WWII; was a source of debate between Fed and Treasury over appropriate price support, or interest rate ceiling, at which the Fed was obliged to intervene with government bond purchases

- dispute came to head in 1950 for Korean War; caused a mild speculative boom accompanied by gold outflows associated with purchase of war material from abroad; market interest rates rose significantly, reducing demand for low-yielding government

bonds; at the same time the Treasury's war financing resulted in large amounts of new government debt, which placed burden on the Fed to buy debt in the open market; if they did this, the open market purchases would exacerbate inflation with excessive monetary growth already caused by the speculative boom; these conditions eventually led to the Treasury-Federal Reserve Accord 1951 where the Fed was relieved of its responsibility to maintain a price support for US government debt

-this disconnection ended the Treasury's virtual dominance of monetary policy which had begun in 1935, although the Treasury continued to have influence; the accord forced the Fed to reinterpret its legislative mandate and basic policy objectives- Annual Report 1952, where it acknowledged importance of quantity of money in addition to official concern with credit policy as its monetary policy; ever since the 10<sup>th</sup> report 1923, the Fed's mission has been to control the quantity of credit in the economy

-1952 document: monetary growth was to be regulated in a manner consistent with 0 inflation on average, and expansion and contraction of credit was to be regulated to smooth out business cycles; the specifics of achieving those goals were left to the discretion of the policy makers at the Fed and hence susceptible to Treasury influence; the Fed had been reestablished as the monetary authority however

### **9. Collapse of Bretton-Woods Agreements: 1952-1973**

-the US became the main helper to rebuild the world after WWII; to ensure monetary stability, everyone deemed necessary to guarantee a stable purchasing power for their currencies; all countries had abandoned gold and silver standards before or during the war; a return to a managed gold standard was deemed optimal, whereby gold could serve as the anchor for the international monetary system; this was embodied in the international Bretton Woods Agreements 1945, where a system of fixed exchange rates to the US dollar was established, which in turn was pegged to gold at the exchange value of 35 per ounce; effectively, all currencies had a known value in relation to gold

-withstood various strains over the years, but none major until 1960

-1960's was Vietnam and Johnson's liberalisation policies; did not want to raise taxes, so issued new debt, which the Fed could monetise or not monetise

**\*monetising the debt-** the Fed buys up securities when the Treasury issues them; this results in the Treasury getting their money, interest rates remain low because there aren't as many on the open market, and the money supply increases somewhat (depends on where Treasury spends the money)

-Johnson exported inflation, when he pressured the Fed to monetise the debt; to enforce the fixed exchange rates under Bretton Woods, European central banks were forced to intervene in markets to support the dollar by buying dollars; this deflated the dollar but inflated European currencies; inflation was also increased in the US however, just by not as much as it would have been; there was difference between 1965 and pre-1951 years, as there was price ceiling and clear support price in pre-1951 years, but no such distinction in the Johnson administration

-this continued for several years until the inflation in Europe began to strain their domestic policy goals; France and West Germany in particular became reluctant to further inflate their economies by purchasing US dollars; they along with other European countries threatened to redeem their vast holdings of US dollars for gold, as per the Bretton Woods agreement; the Treasury feared this resultant sizable loss from its gold

stock would lead to an international run on gold in the US to deplete its reserves, and thus the US unilaterally broke its international commitments and took itself off the gold standard; in 1971 the gold window was shut down and the dollar could no longer be redeemed for 35 per ounce; by 1973 the remnants of Bretton Woods, fixed exchange rates, had vanished; countries were now letting market forces float their currencies against each other; all central banks were issuing fiat money; there was no longer an anchor for the international monetary system

### **10. Post-Bretton Woods and the Humphrey-Hawkins Full-Employment Act**

- the Fed again had to reconsider its mandate and price control
- the Fed became committed to a countercyclical monetary policy by 1973; OPEC began their stuff that year, and gold prices rose to more than 200 per ounce; fearing a recession, which did occur, the Fed continued the monetary policy of rapid monetary growth
- \***stagflation**- atmosphere of recession and rising inflation
- Congress passed bill in 1974 requiring the Fed to report to Congress anticipated growth rates for money and credit aggregates; had been doing this, just made it formal
- \***Humphrey-Hawkins full employment act 1978**- stated explicitly what the Fed's goals was to be, and established a system of congressional oversight; within broad parameters, the Fed was charged with pursuing a full-employment countercyclical policy while maintaining low inflation; this act reinforced the relative independence of the Fed in establishing and implementing monetary policy; now it was not subordinate to the Treasury, but instead subject to review by Congress
- under these provisions, the chairman of the board of the Fed must submit a semi-annual report to the Congress; reports were to include: the System's macroeconomic forecast, description of current Federal Reserve policy, and a list of target ranges for the growth in the monetary and credit aggregates; the Fed reports target ranges for M2 and M3 and a monitoring range for total consumer credit
- this was partly to establish accountability of the Fed in controlling the price level, because the dollar was no longer required by law to be pegged to gold; these initiatives failed miserably for the first 5 years from 1975-1980, as the Fed reported ranges every 6 months but completely ignored them in practice, and for 5 consecutive years the money supply exceeded the Fed's own targets; by 1979, the consequence of the Fed's first decade of policy without discipline of the gold standard was double digit inflation
- \***base drift**- what occurred in the 1970's Fed monetary policy; they set targets, but when they failed to reach those targets, instead of refocusing on them, they set completely new ones and disregarded how far it had missed
- Fed abruptly reversed course in October 1979 and instituted tight monetary policy; most severe contraction of money supply since Great Depression, dropping inflation from 14% to 4% from 1980-1984; since then inflation rate has remained in the 3-7% range
- in the 1985, with its disinflation experience behind it, the Fed explicitly stated that price stability, initially defined as 0 average inflation, was its long-run policy objective; in the absence of the discipline provided by the gold standard, the Fed was unable to achieve that goal since then
- the Fed does have complete independence now however
- under Humphrey-Hawkins (still in effect today, the Fed's goals are full employment and low inflation)

## **11. Circulating Currencies in the US from the Civil War to the Creation of the Fed 1860-1913**

-in 1860, more than 1600 private bank notes were in circulation in the US; the Federal government's contributions were restricted to the Treasury issues of gold and silver coin and certificates

### **4 Problems with Monetary System of Multiple Issuers**

1. inefficiency- hard to accurately price each currency

2. risk of default

3. redemption difficulty- usually only at the issuing bank

-the more distant the transaction from the issuing bank, the more the note would be discounted; technology could have helped

4. demand deposits were not used a lot- just for business or large intrabusiness transactions

-the Civil War led to the collapse of many banks and the disappearance of their notes

-National Bank Act 1863-1864 called for consolidating private bank notes into a national bank note; private banks could be US securities and get national notes in exchange; any private bank wanting to issue private currency had to pay a tax of 200%; they were taxed out of existence

## III. Equilibrium Analysis

### Full Employment and Monetary Policy Neutrality

#### 1. Modelling the Economy as a Collection of Aggregate Markets

-monetary policy goals can be set at anything: the most enduring are stable growth and stable prices

**\*transmission mechanism**- the process by which a change in the money supply filters through the economy and ultimately determines a new equilibrium price level; however, in this particular application of the model, the only effect of a change in the nominal money supply is it induce equiproportional changes in nominal variables while leaving the real economy unaffected

**\*monetary neutrality**- the ineffectiveness of monetary policy, or the inability of a change in the level of the nominal money supply to affect the real economy; basic theoretical result that occurs in a variety of models

**\*aggregate market**- economists use a theoretical construct, the aggregate market, to think through the actions in an economy; an aggregate market is an approximation to reality; grouping of similar items for which meaningful supply and demand schedules can be obtained, such that an equilibrium price and quantity can be determined; M1, M2, CPI, GDP. GDP deflator

-the aggregate market can then be divided into multiple aggregate markets to analyze: macroeconomic effects of policy or non-policy related shocks; more partitions or aggregate markets, more intractable the model becomes

-parsimony is a good rule: short-run equilibrium model of a macroeconomy that is helpful in analyzing the effects of a change in monetary policy on employment, prices, and output; these variables are used to define the policy objectives

-the model can also be used to analyze productivity and preference shocks; without such shocks, there would be no business cycle and no role for monetary policy

#### Useful Assumptions

1. 5 aggregate markets: money, goods, labour, bonds, physical capital
  2. short-run is 1 year; 1 period is 1 year; 1 period bonds paying only on maturity
  3. stock of physical capital is fixed (for 1 year); all changes in the long-run
  4. closed economy; international trade has negligible effects; no foreign exchange markets or trade, central bank concerned only with domestic dollar and purchasing power
- the short-run has consistently dominated monetary policy making  
 -US economy is only 12% exports, while German is 50%; different economies must make different closed v. open assumptions

## **2. Principal Economic Agents and Their Roles in Determining Equilibrium**

-the pursuit of the 3 groups is what leads to optimal decisions that determine the shapes of the supply and demand curves in the markets where the groups interact

### **3 Groups**

#### **1. Households**

-objective is to maximise utility, which is derived from consumption and leisure

#### **3 Decisions**

1. consumption/savings: determines aggregate demand for consumption goods
2. allocate savings: financial assets, money, 1 period bonds
3. labour/leisure: how much time (real resource) to allocate, aggregate supply

#### **2. Firms**

-objective is to maximise profits

#### **2 Decisions**

1. investment: to raise future production possibilities frontier; must borrow, determines aggregate supply schedule for 1 period bonds
2. short-run production decisions: labour input; capital stock is fixed in short run; determine aggregate supply in goods market and labour demand schedule for economy

#### **3. Government**

-useful to abstract from fiscal policy, as purpose of model is to examine short run effect of monetary policy on economy

-government expenditures on goods are 0, no taxes, no bonds; only role is to supply money

-assume money is printed and transferred directly to households; doesn't consider financial intermediaries, policy groups within the Fed, and the government securities markets

-by altering rate of monetary injections, it can achieve short-run macroeconomic goals of stable growth (full-employment) and stable prices

**\*comparative statistics-** model allowing examination effects of certain monetary policy decisions on the economy; start with equilibrium, then shock the markets and compare quantities and prices of goods before and after

### **3. Household Preferences**

-utility maximisers and derive utility from consumption and leisure; they have diminishing marginal utility in consumption and leisure

-household preferences are also stable: any increase in consumption must come from leisure

-the aggregate remains the same as well because the amount of households switching to leisure will be offset by the amount of households switching to consumption

### **4. Consumption/Savings Decision**

-periodically, the household receives real wage income from labour services and real interest income from bonds purchased with savings

-a portion of this income is dedicated to consumption and the remainder to future consumption possibilities (savings); consumption/savings decision depends on relative intensity of household's preferences for consumption in the current period

-the household will typically allocate the same amount of each period

### **5. Portfolio Allocation Decision**

-only 2 financial assets in the small closed economy: money and bonds; savings must be divided between these 2

-the household must maintain a certain quantity of money to meet its planned consumption expenditures while minimising the cost of cash management

-the household therefore demands real money balances  $(M/P)^d$  that rise with planned consumption expenditures and fall with the opportunity costs of holding money as determined by the bond rate ( $r$ )

-increases in planned consumption can be either to: increase in real income, or increase in intensity of preference for current-period consumption

-the portion of savings the household does not retain as money is used to purchase 1 period bonds that are issued by firms and sold at a discount

-higher bond rates increase the opportunity costs of holding money, which causes a portfolio shift adjustment by inducing households to shift wealth from money to bonds

### **6. Labour/Leisure Decision**

-the role of households in the labour market derives from their decision on the optimal allocation of time between supplying labour services and taking leisure; to entice a household to give up leisure for more labour, the opportunity cost of leisure time must be raised by increasing the real wage rate; higher wages increase the consumption and therefore utility of the household

-technology improvements can permanently increase productivity of labour; this increases demand for labour and decreases supply, thereby increasing labour wage rates and increasing leisure time, because less labour is used; therefore this increases the wealth of the household; firms have a permanent increase in their demand for labour because productivity of labour has increased

-a shift in preferences from labour to leisure would result in households demanding more real wages to continue supplying labour at the same quantity; the shift in preference toward current-period leisure reduces the household's supply of labour

-diminishing marginal utility of consumption associated with higher real wages

### **7. Technology of the Goods-Producing Firms**

-must also characterise the economy's technology for transforming the factor inputs of capital and labour into output in the goods market

-as technology improves over time, the same quantities of labour and capital produce more output

-in a macro model, the interest is in relating the total stock of capital in the economy and the total level of employment in the economy to the economy's total output, GDP

-aggregation can again be an issue here, as all firms do not have the same production processes or production function, although we can still get an average

-output for the economy as a whole rises with an increase in total plant and equipment, increase in employment, or improved technology

-since this is a short run model and capital stock is fixed, firms can raise output in the short run only by increasing level of employment; for a given level of technology, once



the equilibrium level of employment is known, output for the economy as a whole is known

-there is an inflection point where the MPL changes from increasing to diminishing; firms will hire somewhere in the area of diminishing marginal returns

-the MPL is a negative function of employment and a positive function of the level of technology

-in the long-run, firms plan for expansion by increasing their investment in plant and equipment; an important factor determining the level of investment is technology; just as improved technology raises the productivity of labour, it raises the productivity of capital

-the firm faces diminishing marginal returns to capital; for a given level of technology and labour employment, successive increases in the capital stock used in production increase output but at a decreasing rate

-although this relationship governs firms long run decisions about future expansion, it is of interest in the short run equilibrium also because shocks to the economy today may affect the productivity of capital in the future and thus investment decisions in the short run

### **8. Production and Labour Demand Decision**

-firms employ factors of production up to where the marginal factor costs equal marginal revenues

-in the short run model, once the level of technology is given, the production decision is completely determined by employment because the other factor of production, capital, is held constant

-as real wages in the economy fall or as the level of technology rises, the demand for labour will rise according to the profit-maximising relationship

-hiring will always take place in the region of diminishing marginal returns, and improvements in technology are represented by a rightward shift in the aggregate labour demand schedule; improvements in technology increase demand for labour

### **9. Investment and Bond Supply Decision**

-over time the firm's stock of productive capital depreciates; the loss of plant and equipment erodes the firm's capacity to produce goods; to avoid loss of capacity, the firm must invest in new plant and equipment and must increase investment if they want to increase capacity

-it determines its optimal level of investment by equating its real marginal factor cost of the investment to its marginal product of capital; MPK is a negative function of the stock of capital (because of diminishing marginal returns to capital) and a positive function of the level of technology, which establishes the productivity of capital

**\*cost of capital, marginal factor cost-** interest rate paid on funds raised for investment

-in the short run, the firm finances these investments almost exclusively with the proceeds from the sale of 1 period bonds sold at a discount

-increases in technology increase the supply of bonds; this is because technology is a permanent increase in productivity of capital, and firms respond by increasing their investment, thereby needing larger bond issuances to fund the additional expenditures on investment goods

## 10. Government Money Supply Decision

-the quantities of money and bonds demanded by households and quantity of bonds issued by firms are measured in real terms, units of goods; the government determines the nominal values of money and bonds in the economy in its role as the monetary authority; it does so by printing money, which it then injects into the economy through direct transfers to households; this action increases the household's nominal savings and can therefore affect its portfolio allocation decision; over time, the accumulation of monetary injections into the economy establishes the economy's money supply,  $M^S$ , and therefore the price level,  $P$

-the real stock of money supply in the economy is found by deflating the nominal money supply by the price level:  $M^S/P$

-because the nominal money supply is determined exogenously as a matter of policy, the money supply schedule is assumed to be perfectly inelastic with respect to the bond rate

-increases in the nominal money supply with no changes  $P$  increases the real money supply; increases in the  $P$  with no increases in the nominal money supply reduce the real money supply

## 11. General Equilibrium

-general equilibrium occurs when households make consumption/savings, labour/leisure, and portfolio allocation decisions to maximise utility and firms make production and investment decisions to maximise profit; given the resources in an economy (labour capital) and a monetary policy

-this is the set of equilibrium  $P$  and  $Q$  conditions that clears the goods, labour, money, and bond markets

-for the economy to be in general equilibrium, all markets must clear simultaneously

\***Walras' Law** -states that if  $N-1$  markets are cleared, then  $N$  markets are in equilibrium; therefore, a macroeconomic shock to 1 market disturbs the equilibrium in at least 1 other market; impact of the shocks must be examined by looking at all other markets

-the bond rate represents the price variable in the financial markets; bond price and bond rate are inversely linked and carry same information; not useful in monetary policy however; we need the rate not the price

-the bond rate also serves as a price variable for real money balances by representing the opportunity costs of holding money; in the money market at the bond rate ( $r$ ), the equilibrium quantity variable is the level of real money balances ( $M/P$ ); this decomposition is essential to monetary policy, unlike that of the real equilibrium quantity of bonds, because price stability is 1 of the central bank's objectives to be analysed

-that is, the central bank determines the nominal money supply in circulation in the economy, but the demand for money is in real terms; therefore, for a given monetary policy, equilibrium in the money market determines the price level

## 12. Full Employment

-the level of employment that clears the markets

-given the level of technology, as long as the real wage in the market and the level of employment in the economy are on the labour demand curve, firms are maximising

profits; they are constrained only by the level of technology and the current stock of capital used in their production processes

-for the labour supply schedule at a given level of technology, households are maximising utility whenever the real wage in the market and the level of employment in the economy are on the supply curve; they are constrained only by their own preferences and by time

-therefore, the intersection of the labour demand and supply curves yields an equilibrium real wage and employment where the firms and households are both optimising

-this definition does not imply that unemployment associated with full employment is 0; firms would gladly hire for lower wages, but households will not supply because they lose leisure time; the positive level of unemployment associated with full employment is the natural rate of unemployment

-as the economy evolves over time with changing technology and preferences, both the level of employment associated with full employment conditions and the natural rate of unemployment will change; therefore, when the government pursues short run goals of full employment, it is impossible to measure what full employment is or whether it has been achieved

### **13. Monetary Policy Neutrality**

-principle objectives of monetary policy pursued by many central banks around the world are stable growth and stable prices; regarding the short-run, this translates to keeping the economy at full employment while minimising price level fluctuations; these often contradict each other

**\*monetary policy neutrality**- any policy pursued will have no effect on the real economy, which makes it impossible to pursue stable growth objectives

-when the economy is already at equilibrium, increases in the nominal monetary supply will have equiproportionate changes in all nominal variables, but no changes in any real variables

-the central bank must be able to influence the real variables to achieve goal of stable growth; stable prices can still be achieved

-prices will need to be stabilised when the economy undergoes technology and preference shocks

# Economic Fluctuations and Monetary Accommodation

## 1. Total Factor Productivity Shocks

-many macroeconomic theories attribute a large share of the short run fluctuations that collectively constitute the business cycle to unexpected changes in productivity

-this includes: productivity shocks, technology shocks, or supply shocks

-shocks differ, but what they have in common is that they can alter the quantity of output obtained from given quantities of factor inputs (K and L) in the production process

-K and L productivity are affected, which in turn may alter C/S, portfolio allocation and leisure/labour decisions of households and investment and labour demand decisions of firms

-as the shocks can't be predicted, their randomness can result in randomness in equilibrium P and Q that clear the aggregate markets, such as the labour or goods market; however, a random productivity shock can elicit systematic responses among macroeconomic variables (output and wages increases); the study of this relationship among variables is very important

-random variations in household preferences results from: changes in value placed on leisure and consumption; preferences are generally assumed to be stable

-these shocks cause changes in households and firms as well; but, they are relatively short-lived, whereas productivity shocks are usually persistent

## 2 Sources of Macroeconomic Fluctuations

1. productivity shocks

2. random variation in household preferences

-for the simple model, changes in productivity are assumed to be permanent changes in technology in the aggregate production function

## 3 Empirical Facts

1. average work week length hasn't changed since WWII

2. S rate is constant over time

3. real interest rate on capital assets in US has been stable over time

## 2 Household Preference Shocks

1. intratemporal- current leisure to consumption

2. intertemporal- discount future leisure for consumption

-don't call for policy attention because they are short-lived, but do frustrate policy makers because they can easily be confused with productivity shocks

-the economy's technology for transforming K and L into output goods is characterised by the short-run aggregate production function

-the MPL is a negative function of the level of employment, because of diminishing marginal returns to L, and a positive function to the level of technology; the MPL is the slope of the aggregate production function

-when a positive productivity shock occurs, technology increases and the short-run aggregate production function shifts up; this shift is proportional to the level of output prior to the shock

-if the initial level of employment is 0, the level of output must be 0 regardless of the level of technology in the economy; this is important for the graphical depiction of the effect of productivity shocks on the economy, because the productivity shock tends to increase the MPL; therefore, for the same level of employment, an increase in the level of technology raises labour productivity

-K is also more productive as a result of the improved technology; there are diminishing marginal returns to K, but improved technology raises K productivity

-in this short-run macro model, the K stock is fixed but its productivity is not; therefore, an increase in technology  $\theta$  raises the productivity of both K and L and in fact, the productivity improvements of the 2 factors of production are equiproportionate ; for that reason, increases or decreases in  $\theta$  are called total factor productivity shocks (factor specific productivity shocks)

## 2. Response of Firms to a Positive Productivity Shock

-when a positive total factor productivity shock occurs, firms want to increase their employment of both K and L

-worker's receive real wages that reflect their contribution to the profits of the firm; a worker's real wages reflect the MPL, or the productivity of the marginal worker

-the equilibrium real wage, is just equal to the slope of the initial aggregate production function when evaluated at the initial level of employment

-after the productivity shock occurs, the aggregate production function shifts upward and the MPL for the same level of employment increases; this means either the real wage or the total labour force must increase

-firms also increase their demand for K, which has become more productive; but K stock takes time to build; the first step is more investment and purchases of investment goods, which means a rightward shift of the bond supply schedule

## 3. Response of Households to a Positive Productivity Shock

-3 decisions by households: consumption/savings; labour/leisure; portfolio allocation

-utility is derived today from leisure, but can be increased in the future by substituting labour for leisure today; increasing the supply of labour services to the market today causes labour income to rise

-when positive productivity shock occurs, the MV of the household's real resource time increases; households could work more due to increases in the real wage due to productivity gains, or they could work less and gain more leisure time while still maintaining the same amount of wages, thus maintaining their current and future levels of planned consumption

**\*substitution effect-** substitute leisure for labour when the real wage rate of labour increases due to productivity gains; movement along labour supply schedule

**\*income, wealth effect-** labour can be reduced due to an increase in wealth; due to technology productivity gains, now can work less; leftward shift of labour supply schedule

-the empirical fact that work week has not changed since WWII means that the income and substitution effects off set each other, even though labour productivity has continued to increase

- once the new equilibrium is reached after the productivity shock has been fully absorbed, the level of employment should return to its equilibrium level
- the empirical fact that  $S$  has not changed since WWII means that increases in real wages will lead to increases in consumption and savings proportionately; equal %s
- portfolio allocation between  $S$  and bonds can be determined by looking at the bond market; first  $S$  rises, bond rates fall as more funds are chasing fewer bonds; empirical fact that interest rates are stable in the long run suggests that once the economy absorbs the productivity shock, the bond rate will return to equilibrium levels
- higher levels of consumption increase the household's demand for money; for household's asset portfolios to return to equilibrium balance, the money market as well as the bond market must clear at the bond rate; thus, the increase in demand for money leads bond prices to rise unless there is a corresponding increase in supply of real money balances; therefore, unless the nominal money supply increases as well,  $P$  will increase; so only a decline in  $P$  can restore equilibrium balance to household's portfolios

#### **4. Determination of Nominal Wages**

- real wages can rise due to an increase in the nominal wage and/or a decrease in prices; difficult to apportion changes in real wages between these 2 nominal variables
- in modern theoretical macroeconomic models, the decomposition of real wages is possible once the general preferences of households that ultimately determine their 3 decisions have been given explicit mathematical formulations
- common theoretical assumption: once the productivity shock is fully absorbed, nominal wages appear unchanged; therefore, the positive productivity shock that is unaccompanied by a change in the money supply ultimately leads to an increase in real wages that is due solely to a fall in the price level

#### **5. Equilibrium Analysis of a Positive Productivity Shock without Monetary Accommodation**

- results from equilibrium analysis indicate that the productivity shock produces changes in some of both the real and nominal variables
- among the real variables: real income, output, real wages, and real money balances rise and the level of employment and bond rate remain unchanged
- among the nominal variables: the price level falls and nominal money supply and nominal wages do not change
- they all shift accordingly however

#### **6. Equilibrium Analysis of a Positive Productivity Shock with Monetary Accommodation**

- the policy objectives of the central bank are: stabilising output growth around full employment while maintaining a stable price level
- for a positive productivity shock, it usually fully absorbed and the economy moves to a higher level of output, but remains consistent with full employment; therefore, no policy response is necessary from the central bank for short-run policy goals
- $P$  have not remained stable however; the decline in  $P$  is not consistent with the stated goal of maintaining a stable  $P$  environment; the central bank failed to supply a sufficient quantity of money to prevent a decline in the  $P$  level

-the central bank could be considered the 3<sup>rd</sup> part of the model; it chooses the nominal quantity of money to achieve objectives of stable growth around full employment and stable prices; hence, the nominal money supply depends on the level of technology in the economy

-when the central bank intervenes and increases the money supply in response to the productivity shock:  $P$  and nominal wages do not change, so the real wage rate does not change; this means that households are less willing to supply labour, so firms must increase the nominal wage rate so real wages reflect the increase in productivity

-without central bank intervention, nominal wages do not change and real wages rise because of decline in  $P$

-in both examples real wages rise to clear the labour markets as a result of the knowledge by households and firms that there has been an increase in labour productivity; the latter also reflects knowledge that the central bank will intervene to prevent the  $P$  level from dropping

-none of the players: central bank, firms, or households, have superior knowledge and all are assumed to know the objectives of the economy and the other groups

-the new equilibrium therefore reflect complete knowledge from all parties

## 7. Preference Shocks

-most economic theories are built on the premise that household preferences are stable; however, stability does not imply that in the aggregate, random fluctuations in preferences (preference shocks) are not present, but they are only transitory

-because they balance themselves out, the central bank has little need to worry about them; but, the issue is that they are easily confounded with productivity shocks

-therefore, the signals from the economic data the central bank analyses for productivity shocks is made noisy by the presence of transitory preference shocks

-some feel that preference shocks are sufficient to warrant monetary response, because of: long-term nominal wage contracts and physical capacity constraints on output, which can amplify the effects of preference shocks on the economy

### 2 Types

1. intratemporal

2. intertemporal

-in both cases, the household's 3 primary decisions are altered which induces transitory equilibrium fluctuations into the economy

## 8. Intratemporal Preference Shocks

-an increase in any period in a household's utility for consumption in relation to its utility for leisure

-with intratemporal preference shocks, households may increase their intensity of preference for current consumption while simultaneously decreasing their intensity of preference for current leisure

-real sector: employment, output, income, and real money balances rise; real savings, real bonds, and the bond rate remain unchanged; real wage rate falls

-nominal sector: prices, nominal savings, nominal bonds, and nominal wage rate fall; nominal money supply remains unchanged

### **9. Intertemporal Preference Shocks**

- an increase in any period in the rate at which the household discounts future utility in general, whether derived from consumption or leisure
- households become more impatient to receive utility; greater value is placed on current consumption and leisure, and thus the demand for both rises
- leads to declines in: employment, output, investment
- leads to increases in: productivity (and real wages), bond rate, and price level, interest rates
- the net effect on consumption is ambiguous and depends on whether the change in the labour/leisure decision that reduced output and income dominated the change in the consumption/savings decision that favours current consumption over savings
- in the special case where these 2 effects are exactly offsetting, household's desire to raise current utility at the expense of the possibilities for future consumption and leisure is fully manifested as an increase in the amount of current leisure taken and a reduction in S and I; households are therefore working less and reducing their S to maintain their current levels of consumption



## Stabilisation Policy when Firms Set Prices in Advance

### 1. Price Setting by Firms

-the model presented assumes that the economy adjusts rapidly to full employment, and that a monetary policy response to the 2<sup>nd</sup> objective can exist without compromising full employment

-this model further assumes that employment fully adjusts to productivity shocks within the time horizon of interest for the study of monetary policy; in actual economies, output tends to fluctuate around its full-employment level over longer time periods, during which the level of employment is found to be positively correlated, or to rise and fall, with the short-run fluctuations in output

-1 source of short-run employment fluctuations is the stickiness of prices; when P are set in advance, households will not experience increase in real money balances that accompanies a P decline from a productivity shock; this inflexibility in real money balances imposes a liquidity constraint on households that limits their ability to raise C to obtain higher levels of utility

-households may loosen the constraint by increasing the velocity of money; increases in velocity imply a greater volume of real transactions is conducted for a given level of real money balances; this response puts a greater demand on household's resource time, which reduces their willingness to offer labour services to the market; therefore, in equilibrium when prices can't adjust employment falls to a level before full employment and output is correspondingly lower than it otherwise would be had prices been allowed to adjust freely

-if this situation persist, the monetary authority may have to intervene to relax the household's liquidity constraint; that is, with prices fixed in short-run, an increase in the nominal money supply will increase real money balances and household's consumption can rise—the right quantity of money can lead to labour/leisure not being affected in the short-run, households will make decisions consistent with full employment, and the equilibrium quantity of money also coincides with an unchanged price level

-therefore, the dual monetary objectives of full employment and price level consistency are both fulfilled; the stickiness of goods is rendered optimal by the increase of the nominal money supply by the monetary authority

### 3 Model Possibilities

1. productivity shocks with action
2. productivity shocks without action
3. preference shocks added in (signal extraction problem)

-firms make investment and labour demand decisions based on full information of current period; the equilibrium goods price and nominal wage rate are determined by these decisions of firms along with household's decisions and monetary authority decisions

-firms may encounter costs when changing prices so that they can't make adjustments during the period; this slow adjustment issue can be compensated for in models by setting

prices at the beginning of the period prior to realisation of productivity shocks and preference shocks

-permanent preference shocks are held constant over the period and preference shocks will dissipate over the period

-with prices set, firms observe their own productivity shock and use that information to select their labour demand schedule and make their investment decision; then adjustments follow in the nominal wage, the bond rate, and quantities in various markets that result in a new short-run equilibrium for the economy

### **Sticky Price Theories**

-micro theory states that only firms with monopoly power can set prices

1. firms produce slightly unique products for monopoly power
2. competitive but long-lived firms that set prices at market clearing values
3. continual monitoring by firms that set prices as trading takes place

### **2 Sluggish Price Adjustment Theories**

1. menu costs
2. preannounced product prices are implicit cost contracts not to be broken

## **2. Liquidity-Constrained Households**

-the household ostensibly makes decisions with full information of firms and monetary decisions and of productivity shocks; households must hold the same quantity of nominal money as that supplied by the monetary authority, which limits the quantity of nominal consumption expenditures the household can make

-the only way to increase the volume of nominal consumption expenditures for a given nominal money supply is to increase the velocity of circulation of money within the period; but because that is costly, households cannot velocity with impunity

-however, if prices are flexible, then the volume of real consumption purchases is not constrained because households need not increase velocity; that is, a positive productivity shock induces a fall in the price level such that real money balances rise; hence, households can raise their real consumption purchases without incurring additional transaction costs, even though nominal expenditures may not change

-when prices are sticky though, the constraint on the nominal money supply imposed by the monetary authority also constrains real money balances and thus limits the volume of real consumption purchases; attempts to increase velocity is curtailed by increased transaction costs; thus, less time is available for production and leisure, which affects the labour/leisure decision and thus equilibrium in the market

-if prices were flexible however, the improved technology would have caused the household to increase the value it placed on its leisure time

-some of the decline in labour services offered to the market is also intended to replace the lost leisure associated with the greater cost of transacting; leisure time increases to offset the loss in utility from consumption

## **3. Equilibrium Response Without Monetary Accommodation in the Absence of Preference Shocks**

-economy receives a permanent shock before 1<sup>st</sup> period, and nothing for next 2 periods

-the economy will show some fluctuations that are undesirable in terms of the policy objectives of the monetary authority; in response to a positive productivity shock, output

initially increases and employment falls; therefore, output rises less than it would have if full employment had been maintained

-prices do not remain stable even after the period of weak output subsides and the economy adjusts back to full employment; they fail to reflect the fact that the monetary authority failed to provide a sufficient quantity of money to the growing economy to meet its growing liquidity needs

-therefore, over the 2 periods when the economy is adjusting to the productivity shock, both of the monetary policy objectives are compromised

#### **4. Equilibrium Response With Monetary Accommodation in the Absence of Preference Shocks**

-the household's liquidity constraint can be alleviated by the monetary authority had it chosen to increase the nominal money supply in response to the productivity shock

-prices do not have to fall for real money balances to rise and thereby relax the liquidity constraint that households would otherwise experience; the economy is able to absorb the positive productivity shock by increasing output while remaining at full employment without a change in price level; thus, the monetary authority is able to exactly achieve its policy objectives by accommodating the greater liquidity needs of the growing economy with an increase in the nominal money supply

#### **5. Monetary Policy and the Signal Extraction Problem**

-in actual economies, when the monetary authority makes a policy decisions, it is based on information collected from a variety of sources, including: households and firms, professional opinions, and economic data

-when shocks occur, it can be reflected in wide variety of information; different shocks often occur simultaneously that require different policy responses however

-these shocks cannot be resolved quickly from the information made available to the monetary authority, and thus policy makers must make judgments and must attempt to correct their mistakes best they can ex post

-the monetary authority wants to process the information it has on the shocks in a way as to separate the permanent from transitory nature shocks

**\*signal extraction problem-** whereby individual signals about the state of the economy can have multiple causes

-the monetary authority wants to try to identify the preference shock; use past history and surveys are good ways

#### **6. Equilibrium Response With Monetary Accommodation in the Presence of Intratemporal Preference Shock**

-what happens is: the preference shock occurs, and the monetary authority responds to the liquidity constraint to reach a new short-run equilibrium; after the preference shock dissipates, the monetary authority can analyse their decisions

-in general, for a given productivity shock, the stronger the unidentified preference shock, the greater the extent of the mistake in the monetary policy decisions governing the nominal money supply in the economy, and the more likely it is the economy will be farther away from a time path that characterises the policy objectives of full employment and stable prices

-when the monetary authority does intervene, a sound reading on the economy is essential

### **7. Equilibrium Response With Monetary Accommodation in the Presence of Intertemporal Preference Shock**

-households discount the future more for today

-inappropriate policy response to the transitory preference shock causes the monetary authority to fail to accomplish fully either of its objectives of full employment and stable prices; it fails to supply a sufficient quantity of money in response to the positive productivity shock and the economy grows less rapidly, with employment falling below its full-employment level

-as with intratemporal preference shocks, the monetary authority must be able to separate permanent from the transitory shocks; resolution is not available ex ante, and such policy mistakes will be made

## Stabilisation Policy in the Presence of Long-Term Nominal Wage Contracts

### 1. Keynesian Labour Market

-when prices are inflexible, real money balances cannot rise until the monetary authority intervenes with an increase in the nominal money supply and the economy remains at full employment-- monetary policy is non-neutral; the real economy is affected by the policy decision

-in the absence of productivity shocks, the labour contracts that set nominal wages in advance preclude an adjustment of the economy to the full-employment level in which prices remain stable

-the short run definition of full employment may include preference shocks; because they are transitory, the short run may differ from long run definition full employment, which ignores transitory shocks

-Keynesian view considers monetary policy as both non-neutral and capable of achieving stabilisation policy objectives to an extent; it views preference shocks as also dissipating, but remaining long enough to warrant possible a policy response

-this view emphasises long-lived, but ultimately transitory preference shocks that take place in an economy with rigidities in the labour market that prevent a rapid adjustment to full employment

-additionally, rather than assuming that firms fix prices in advance, which imposes a liquidity constraint on household's consumption purchases, firms and workers enter into long-term nominal wage contracts that essentially fix the nominal wage in advance; the latter rigidity prevents the economy from rapidly absorbing the preference shock and provides a rationale for the monetary authority to pursue an active stabilisation policy

#### *Emphasises 2 Features of Labour Market*

1. terms of employment for most workers (households) include a precommitment from the firm and the household to a fixed nominal wage

2. limited mobility of labour in the short run that precludes households from moving from 1 sector of the economy to another

-the extent of the effect of these factors is debatable

-therefore, when the economy undergoes transitory shocks labour can't move quickly; further, assumes that all workers are employed under the same contract; labour is set to profit-maximising wages and numbers

-when preference shocks cause real wages to become, due to productivity increases, firms lay off workers and employment falls; the monetary authority may be able to manufacture a price increase that reduces wages by raising the nominal quantity of money in circulation in the economy; as a result, firms increase employment and the economy's output rises

-government intervention is needed to stabilise prices, not achieve full employment; difficult to achieve price stability without compromising full employment however

-policy makers can induce changes to the nominal money supply to satisfy both objectives, and they also include compositional changes in output between C and I

-when nominal wages are set in advance by contractual agreements, the monetary authority must still attempt to achieve dual goals of full employment and price stability  
 -if P rise, then households will supply less labour, as their real wages are set by contract; the firm sees its labour cost has fallen, and hires more workers, going past full employment; for the households, at the lower real wage rate the opportunity cost of leisure time has fallen—therefore, because the house is locked into a contract, they are supplying too much labour and taking too little leisure

-when P falls, the opportunity cost of leisure time increases and the households are supplying too much labour and taking too much leisure as a result of the labour contract; too much leisure is this model's characterisation of involuntary unemployment

-the implications of fixed nominal wage contracts introduce another criticism of such models; because the contracts are always suboptimal ex post, why do households enter into them ex ante (because they have no other choice)

## **2. Response of the Economy to a Positive Productivity Shock when Nominal Wages are Set in Advance and there is no Attempt at Monetary Accommodation**

-nominal wage contracts do not affect the economy's ability to absorb a productivity shock provided there is no intervention from the monetary authority

-with prices flexible, real wages are allowed to adjust fully to their long-run equilibrium level in the initial period of shock without any need for nominal wages to change—prices do not remain stable however, even though employment remains full

-the labour contract that fixes the nominal wage has no effect on the economy's subsequent adjustment to the productivity shock; the economy responds in the exact same way when nominal wages are sticky as when they are flexible; the contract adjusts at the end of the period

## **3. Response of the Economy to a Positive Productivity Shock when Nominal Wages are Set in Advance and there is an Attempt at Monetary Accommodation**

-with nominal wage contracts set, the monetary authority cannot intervene to stabilise prices without compromising the full employment objective

-if the monetary authority is successful in keeping the price level from falling by intervening, the real wage remains unchanged; therefore, for the labour market to clear, a quantity adjustment is necessary—that is, under the improved technology, the real wage is too low and consequently employment rises above the full-employment level

-the inability of either prices or wages to adjust in the short run has induced a quantity adjustment in the labour market in response to the positive productivity shock; output rises above full-employment level, with households over supplying labour and taking too little leisure—they are partially compensated for the utility loss by an increase in current-period C and S for the future; increase in S raises demand for bonds and drops interest rate, thus leading to a temporary increase in demand for money associated with greater liquidity needs of households, and real money balances rise

-at the end of the period, nominal wages freely adjust to restore full employment—at this lower level of employment, the household has more time for leisure and reduces demand

for C, thus lowering demand for money; the monetary authority must therefore reduce the nominal quantity of money to prevent prices from rising; for the monetary authority to prevent prices from rising, they must reduce the quantity of money

#### **4. Is the Full Employment Objective of Stabilisation Policy Inappropriate when Preference Shocks are Long Lived?**

- some permanent shocks end up being negated in the next period by opposite shocks; some transitory shocks last too long for monetary policy to have an effect on the economy, as monetary policy traditionally focuses on short-run objectives
- one long lasting preference shock is that aggregate demand disturbances are a principal source of economic fluctuations in the business cycle that may have undesirable distributional consequences, and therefore should be placed within the domain of public policy; an example is substitution of labour for leisure; a multiplier effect is created from more leisure time available for watching children, daycare centres lose business and lay people off, and people lose income and don't buy as much stuff
- full employment has been identified as with the economy's long-run adjustment to productivity shocks, and the full-employment objective of stabilisation policy is to facilitate that adjustment when prices or wages are fixed in advance
- when preference shocks dissipate quickly, the policy objective and the economic definition of full employment coincide; when preference shocks are long-lived however, the short-run economic definition of full employment differs from the long-run definition, because the former represents optimal resource allocations that take account of changing preferences as well as changing technology (but that abstract from distributional effects) whereas the latter represents only the changing technology
- therefore, an economic policy that is successful at smoothing out business cycles around the long run level of full employment is essentially imposing the optimal long run resource allocations on the economy in the short run; consequently, in terms of economic efficiency, the successful policy could actually be reducing the overall economic welfare of the economy rather than enhancing it
- economic welfare is not an easy concept to define in economies where households are heterogeneous; different households have different utility needs and have; it is not sensible to add up all the utilities to get total welfare, some people have much more than others; equity issues are hard to quantify in economic models

#### **5. Response of the Economy to a Long-Lived Intra-temporal Preference Shock when Nominal Wages are Set in Advance**

- when the economy responds to a positive productivity shock with nominal wages fixed in advance, no monetary policy action is needed to keep the economy at full employment; the flexibility in prices is sufficient to enable real wage adjustments to clear the labour market at full employment; however, when the monetary authority seeks to maintain stable prices, the full-employment objective is compromised
- when the economy is responding exclusively to preference shocks, those results do not obtain in terms of the long-run economic definition of full employment; that is, if the policy objectives of the monetary authorities include the long-run definition of full employment, the price mechanism will no longer cause the 2 policy objectives to be met automatically; so monetary policy response is needed

- in the absence of productivity shocks, however, adopting a monetary policy that achieves the full-employment objective is not in conflict with the objective of maintaining stable prices
- to keep the economy at full employment throughout the period of adjustment to the preference shock without volatility in prices, the monetary authority must intervene; this outcome requires an active monetary policy whereby the nominal money supply is reduced in period 1, thus raising the bond rate to prevent the economy from exceeding its full-employment level of production
- however, to maintain that level of production, the composition of output goods changes; consumption rises and the production of investment goods declines; in the second period, the money supply increases, thereby lowering the bond rate to prevent households from becoming excessively liquidity constrained, which would slow the economy to a production point below full employment

#### **6. Response of the Economy to a Long-Lived Intertemporal Preference Shock when Nominal Wages are Set in Advance**

- when the economy undergoes a long-lived preference shock that is intertemporal, the monetary authority is able to achieve its full-employment and stable price objectives simultaneously; to attain those policy goals, it must conduct an active monetary policy that offsets completely the impact of the shock on the labour market in each of the 2 periods that the preference shock takes to dissipate fully
- the monetary authority is able to achieve its full employment and stable-price objectives simultaneously in each period in response to the intertemporal preference shock that favours current utility over future utility; the monetary authority adds liquidity in the first period to boost employment and output and removes liquidity from the economy in the second period to avoid an overstimulation of the economy that would otherwise occur as the shock dissipates; consumption increases in the first period, while production of investment goods falls



# IV. Descriptive Dynamics and Inflation

## A Critique of Stabilisation Policy

### 1. Monetarist Critique of Stabilisation Policy

-economies are continuously undergoing shocks; shocks may cause an economy to move away from its long-run equilibrium position of full employment, and the economy may not quickly absorb the shocks and remain below or above full employment for an extended period of time

-slow adjustment could be due to: price or nominal wage rigidities in the economy, or to the costly reallocation of the economy's resources of capital or labour necessitated by the shock (from industry adversely affected to industry favourably affected)

-active stabilisation policy requires the monetary authority to monitor and design monetary policies, which requires an extraordinary depth of knowledge of the economy

\***monetarists**- believe that, because of a lack of knowledge, efforts by the monetary authority to smooth business cycles are more likely to fail than to succeed; as a consequence, the economy will become less stable rather than more stable under stabilisation policies they thus believe that active stabilisation policies should not be pursued

-difficult to categorise a list for classical, Keynesian, or monetarist schools of thought

-a fundamental premise of monetarism is that market economies are inherently stable unless they are acted upon by erratic government policies; business cycles are seen to be naturally occurring phenomena that represent part of the evolution of a healthy, dynamic economy; they arise from the need to reallocate resources in a more efficient way when the opportunities for maximising the resources change due to technological progress or other real shocks to the economy

-so, the goal of stabilisation policy to smooth out business cycles may not be proper; if the economy fixes itself, there is no need for it (especially when the time lag is great between policy and effects), and how can full employment be defined (full employment must be properly defined to have a clear policy objective)

-one way to define full employment is with statistical data such as governmental economic statistics; can get long-term trends from this, and

-the problem with this is that the operational definition of full employment on which the policy decisions are based is generally not the same as the economic definition of full employment on which policy decisions should be based

### ***2 Causes of Discrepancy***

1. measurement error of statistics; don't measure correct thing
  2. always fundamental structural changes as better methods of using the economy's resources are sought; past doesn't predict the future
- Keynesian economists would argue that this problem can be minimised by obtaining a large data set; this suggests that the operational definition is open to interpretation—  
monetarists argue that this is a vague statement of intent and subject to change and manipulation; it may become an important source of uncertainty in the economy that can have negative long-run consequences

### **2. Time Lags and Macroeconomic Dynamics**

- there are sequences of equilibria that an economy passes through given a monetary policy as it absorbs a particular set of shocks; the sequence of equilibria changes for different policies, then the sequences and their effects can be compared
- in a dynamic context, the principal objective of stabilisation policy is to attempt to keep the economy continuously at or near full employment; hence, in the design and implementation of policy, timing is everything
- because the equilibrium analysis ignores all the intervening dynamics during the adjustment process between successive equilibria, it may provide an incomplete description of the effects of alternative policy choices and could result in misleading policy recommendations; this is particularly true when the non-policy related shocks are less predictable and involve longer lags than the model suggests
- we can understand the importance of the time dimension for the success of stabilisation policy by considering 4 types of lags and the macroeconomic dynamics that characterise an economy

#### ***4 Time Lags***

1. recognition lag
2. policy design and implementation lag
3. dynamic adjustment of economy to a policy change lag
4. long and variable lags

### **3. Recognition Lag**

- data cannot be monitored continuously except for interest rates and stock and bond prices; usually only available at monthly or quarterly intervals
- policy makers are always relying on old data that reflect what the state of the economy is at the time policy decisions are being taken; additionally, the data is constantly being revised, so that the initial data may not even be the same 2 weeks later
- most common data is the GDP/GNP national income accounts

#### ***3 Stages of Data***

1. initial- 3 weeks after quarter has ended
  2. first revision- month later
  3. final revision- international trade or current account data
- revisions to growth rates can often exceed 50%

-creates a dilemma; act quickly with estimates for data, or wait longer for more accurate data but risk being too late

#### **4. Policy Design and Implementation Lags**

-once the monetary authority has identified a mismatch between its full employment goal and current state

-not much of a problem in the US because of the sophistication of our system

-discount rates and reserve requirements are not used often as they have large or gross effects on the economy; open market operations are considered to have incremental effects on the economy

-changing discount rates and reserve requirements therefore requires more planning and forethought

-FOMC meetings are 8 times a year; Federal Reserve staff members collect data in preparation for the meetings

-ad hoc meetings can be scheduled as well; use telephone conferencing now as well

-fiscal policy implementation lags are much longer; sometimes need new legislation; so there has been a shift from fiscal policy towards monetary policy since 1960

#### **5. Dynamic Response of the Economy to a Change in Monetary Policy**

##### ***2 Main Questions***

1. how long will the adjustment process take

2. how predictable is the economy's dynamic response to the policy change

-monetarists believe that the economy's dynamic response to a monetary policy change involves long and variable lags

-Keynesians say that short-run response is relatively predictable

-most modern economists agree that the response depends on the way in which the monetary policy is altered and the extent to which the new policy is anticipated

-the data that could potentially resolve this issue is not powerful enough to distinguish unambiguously between the 2 theories; we do know that changes in the money supply have historically preceded changes in output and the price level, and the changes have always been in the same direction—increases in the money supply are followed by increases in output and a rise in prices; does not mean the increase in the money caused prices to rise, there are compatibilities

-for exposition, it is useful to characterise monetary policy changes fully by changes in the nominal money supply; therefore, the lag between open market operations and changes in the money supply via multiple deposit creation mechanism are assumed to be relatively short and of little consequence—changes in excess reserves are assumed to be quickly absorbed by the federal funds market by the commercial banks

-therefore, the dynamic response of the economy portrayed is to a change in the money supply brought about by a 1 time change in monetary policy

##### ***2 Categories of 1 Time Change in Monetary Policy***

1. 1 time change to the level or stock of the money supply

2. 1 time change to the growth rate of the money supply

-the latter can induce a sustained increase in the rate of change of the price level, or the inflation rate, while the former cannot

## 6. Sluggish Prices

-monetarists and Keynesians agree on 1 point: there is a stickiness to nominal variables that causes fluctuations in real variables over the period of adjustment; once the monetary authority changes the nominal money supply, all other nominal variables in the economy take time to adjust

-the pattern of economic dynamics is premised on the assumption of sluggish prices and is taken as an empirical fact

-monetarists still envision that the prices adjust slowly in response to a change in the money supply induced by a change in monetary policy, the transmission mechanism they believe is acting is on the theory of demand for money that emphasises the store-of-value feature of money rather than the medium of exchange feature—

-households have a portfolio of assets that constitutes their wealth holdings, and the demand for money is based on the household's determination of the optimal quantities of each of those; hence, the risk adjusted rate of return must be the same for all assets, where the rate of return includes both pecuniary (dollar) and non-pecuniary (nondollar) returns, and the return on real money balances then includes any interest income received as well as the liquidity services that monetary assets provide

-shocks to the economy result in household's asset portfolios thrown out of balance and returns on assets are no longer equal; they have excess supply of some and excess demand for others—the prices and returns of the assets then change, and this portfolio adjustment process in response to a monetary shock is what determines the monetary transmission mechanism

### *Process*

1. all household portfolios in balance
2. monetary authority conducts open market operations; increase growth rate of nominal money supply
3. real money balances increase before prices can adjust; household's wealth portfolios no longer in balance
4. excess supply of real money balances, because the return to money is too low in relation to the return on other assets
5. reduce money holdings by purchasing assets

-implication here is that the excess supply of money coincides with an excess demand for all other assets; as more goods are bought their returns fall; as real money balances are used to buy the goods the quantity of real money balances rise, and their return rises

-if there is no other shock to the economy besides the increase in the monetary growth rate, then final equilibrium consists of increase in the rate of change of all nominal variables by the same % as the original increase in the growth rate of the nominal money supply; if the proportions of all real assets in the household's portfolio, including the real money balances, are the same as they were before, the real sector is seen to be independent of the monetary sector—when that result holds for a 1 time change in the growth rate of the nominal money supply, monetary policy is said to be superneutral

**\*superneutrality**- long-run equilibrium condition not present in all macro models;

-monetary policy is assumed to be superneutral in the long run but not in the short run

## 7. Long and Variable Lags

-2 questions arise: what is the dynamic adjustment process to a 1 time change in the growth rate of the nominal money supply, and how long does the process take and how predictable are the dynamics

-monetarists see the dynamic response of the economy to a 1 time, possible increase in the growth rate of the nominal money supply, to follow a sequence of events where the growth rate of output (or real income) initially rises above its long-run equilibrium level and then subsequently falls below its long-run equilibrium level

-when superneutrality is assumed to hold in the long run, the equilibrium growth rate of output after all the dynamics have settled out equals its equilibrium level prior to the policy change

-the initial response of the economy during the period of higher output growth is termed the **nominal income effect** and the later response during the period of slower output growth is termed the **price effect**—these effects represent net additions (both positive and negative) to output in relation to what it would have been in the absence of the change in monetary policy

### *Sequence of Monetary Effects*

1. nominal income effect – 3 -9 months

2. price effect- 9-18 months

-the sequencing of these effects results from the sluggish adjustment of prices that slows the rate at which inflation rises to its new long-run equilibrium level; however, superneutrality requires that after all the dynamics have settled out, the cumulative changes in the nominal income must equal the cumulative changes in the price level, and the % increases in the equilibrium growth rates of all nominal variables affected must be identical; this ensures that real income growth is unaffected by monetary policy changes in the long run, but what happens to real income (output) in the adjustment stage

-over the time interval, the additional wealth created initially from the nominal income effect of the stimulative policy is offset by the lost wealth that follows from the price effect—if this were not true unlimited wealth could be created by an ever expanding or ever contracting money supply

-monetarists interpret the statistical evidence on the duration of the nominal income effect as ranging from 3 to 9 months; unpredictable the exact date; they interpret the statistical evidence on the duration of the price effect as ranging from 9 to 18 months; equally unpredictable

-this suggests that the combined lengths of these periods could mean a change in monetary policy could have residual price effects on the economy up to 2 years after implementation, far exceeding the normal maximum time horizon for policy objectives of 1 year—this implies that current monetary policy changes can introduce fluctuations into the economy that future monetary decisions will have to confront

-thus, monetarists believe that the economy's dynamic response to policy change involves long and variable lags; their view is that a healthy economy undergoes a continual (but stable) evolution as individuals actively seek better ways to utilise and expand their resources; therefore, when the wealth portfolios are thrown out of balance by an increase in the money supply, it is not possible to predict the exact sequence of the changes that result to restore the market equilibrium conditions because those exchanges are influenced by the ongoing underlying dynamics in the real economy

- many sequences are possible, and as such, prevent the monetary authority from predicting movements of aggregate measures of real economic activity, such as real income or output, that are induced by changes in monetary policy
- a change in monetary policy affects the real economy in the future, but that condition is not sufficient for stabilisation policy to be successful; the monetary authority must be able not only to affect output in the future, but also to predict the response **quantitatively**
- this means it must be able to look to the future and determine how much additional stimulus would be created by a given change in the money supply today; 2 aspects of the response: **timing** and **magnitude** of the response
- if the monetary authority errors in either of these dimensions, then a policy designed to smooth business cycles could have the opposite effect
- the private decisions of households and firms in response to the government's monetary policy choices do not conform precisely to what the monetary authority expects them to be when it formulates policy; to the extent the monetary authority is wrong, its policy selections will be in error and are likely to have unintended effects on the economy

### **8. Stabilisation Policy in Practice**

- most economists believe these problems represent insurmountable obstacles to the successful conduct of an active stabilisation policy
- that is, efforts to stabilise the economy's output around its true economic level of full employment will actually destabilise the economy, with business cycles becoming more frequent and more severe

#### ***5 Causes of Policy Mistakes***

1. use of old data or incomplete set of information
  2. measurement errors and structural changes could mislead the monetary authority into inaccurately portraying the future time path of the full-employment level of output
  3. future shocks to the economy over the time horizon relevant to the policy decision, as well as lack of knowledge of the underlying dynamics at work in the economy at the time the decision was made, either of which could cause the forecast of future economic activity in the absence of a policy change to be in error
  4. the time lag associated with the assessment of the state of the economy and the formulation and implementation of a corrective policy action
  5. unpredictability in the long and variable lagged response of the economy to a policy action
- for example, if the monetary authority reacts to news that ends up being incorrect in the future, then the monetary action will have the opposite effect
  - the additional errors that result from the long and variable lagged responses to the corrective policies are addressed with future policy responses
  - problem with such a policy is that each time new policies are implemented, new dynamics 2 years into the future result, and thus new dynamics result that will have to be considered and dealt with; an erratic policy associated with continuous efforts to fine tune the economy elicits an erratic dynamic response of output that over time necessitates an even more erratic policy with an even more erratic response, and so on
  - this actual process has resulted in a stop and go monetary policy in the US; by the time monetary authority recognises the economic slowdown, the economy is already starting

to recover; the response may not be felt up to 2 years later, thus creating a prolonged recession

-opinions differ as to whether policy makers' ignorance of the short-term state and dynamics of the economy is sufficient to rule out stabilisation policy altogether, or merely to suggest that the monetary authority must be appropriately modest in the degree of activism it exercises in the actual conduct of monetary policy

-because the operational definition of full employment changes over time, monetarists view full employment as an ill-defined policy objective that is subject to manipulation and simply creates confusion for the private sector, where long-term decisions must be made that can be rendered suboptimal by unanticipated actions by the central bank

## Monetary Rules

### 1. Long-Run Policy Objectives

-monetarists' argument is that such policies are not needed, their objectives are not clearly defined, and they are simply not feasible—they require a depth of knowledge of the current state of the economy that no one could possibly possess; but if no policy is not an option (short of eliminating the central bank), then policy should the monetary authority adopt

-monetarists suggest the constant growth rate rule (of money supply) CGR

-this is based on certain long-run growth properties of the economy, about which monetarists for have sufficiently reliable information, but this approach is also imperfect

-better to use a monetary rule instead of fine tuning

-if short-term goals such as employment and output are not achievable, the monetary authority should focus instead on long-term objectives; monetary policy suggests the only reasonable long-term objective is stabilisation of average money price level of goods

-monetary policy should be transparent; the public sector should not have to continuously guess what public policy currently is and how it may change in the future; short-run policy objectives are not attainable—hence, the monetary authority should focus just on the long run and policy goals that are clearly stated

-the long-run neutrality of monetary policy should indicates that a 1 time increase in the money supply (or decrease), has no other long-run effects other than to raise prices—therefore, monetary policy should be directed solely at long-run price objectives

#### *Defining Policy Objectives*

1. define prices

2. clear statement of the time horizon of policy, or what is meant by the long run

3. description of the price behaviour that the policy seeks to achieve

-the prices that are affected in the long-run by changes in the nominal money supply are the money prices of goods and services, that is, the number of currency units (dollars) needed to purchase a car or a haircut; the relative price of a haircut to a car can also change in the long run, but neutrality ensures that in the long run these relative price changes are independent of their respective money prices

-relative price changes could be due to product innovations or changes in preferences

-the monetary authority would want to choose a definition of prices that is insulated from long-run changes in relative prices; it is interested in the general level of money prices of all goods and services in the economy

-to get the measurement of the prices, an index such as CPI or GDP implicit price deflator is needed

-2 differences in price indexes: composition of the baskets; frequency with which the indices are constructed- GDP quarterly and CPI monthly

-the 2 indices behave differently over long time periods; CPI has risen more rapidly recently



- CPI is better for monitoring over time the purchasing power of the nominal wages of households, as reflected in the value of the currency
- to some extent, changes in purchasing patterns are automatically reflected in the PGDP, but that index includes many other items as well, such as business investment goods, that only indirectly affect the purchasing power of a household's nominal wages
- less important which index to choose than to just choose 1 and incorporate it into the policy design and stick with it
- an empirical fact is that money prices fluctuate over the business cycle; therefore, a policy addressing the long-run behaviour of the price level must systematically ignore the short-term fluctuations of prices associated with the business cycle
- the average length of business cycles since WWII is 7.5 years, which suggests that a minimum time horizon for a policy with long-run price objectives is 7 to 8 years; the policy objective is therefore stated in terms of the long-run average behaviour of the price level over the business cycle
- in practice, the implication is that the relative success or failure of this monetary policy can be measured only in relation to the actual cycle-average behaviour of the price level, that is, it must be compared with the stated objectives of the monetary authority
- a long-run average price level is desirable; monetarist policy objective is attainment of long-run average price level stability; this amounts to picking a long-run average inflation rate of 0, such that on average the price level remains unchanged—the implication is that the purchasing power of the currency for the basket of goods used to define the price level remains constant (on average) over time

## **2. Policy Design: The Constant Growth Rate CGR Rule**

- to achieve the price-level objective, the monetary authority must decide how fast to allow the money supply to grow; excessive monetary growth leads to systematic inflation whereas insufficient monetary growth is deflationary
- basis for designing the CGR rule is a stable long-run relationship between money and nominal income (velocity)
- short-term fluctuations in the money supply are a major source of instability in the economy; this suggests a monetary policy designed to limit instability in the real economy that is attributable to monetary sources should be one that stabilises the rate of expansion of the money supply over relatively short time periods

### ***Steps for CGR Rule***

**1. make a forecast of long-run economic growth, which is defined as the cycle average rate of growth of real GDP**—growth rate is determined in part by the continual expansion of liquidity needs that naturally occurs due to economic growth

**2. choose the measure of money whose supply it wants to control**—includes monetary aggregates (M1, M2, M3, L) and reserve aggregates (total bank reserves, nonborrowed reserves, monetary base)

\*2 questions arise here: 1) how much control does the monetary authority have over the supply of the aggregate 2) how predictable is the demand for the aggregate

-the answers to these 2 questions should be based on different time horizons

### **3. choose the time horizon**

-the time period chosen may ultimately depend on which of the monetary or reserve aggregates the central bank selects as the instrument of policy

-sometimes no distinction is made between policy instruments and intermediate targets; by definition, monetary rules such as the CGR rule rely on reserve aggregates as the policy instrument and monetary aggregates as the intermediate target

#### **4. choose the aggregate measure**

in general, the more narrowly defined the aggregate, the closer the control the central bank can exercise over its supply; more control over reserve aggregates, less control the broader the measures (better short-run control of M1 over M2 and M2 over M3)

-the role of bank decisions about excess reserves and the structure of their liabilities and the role of household decisions on the composition of their liquid asset portfolios become more significant as the aggregate becomes more encompassing of a larger set of assets

-the monetary authority can exercise relatively good control over the supply of any 1 of those aggregates over a several-week period; however, the money supply cannot be kept within as narrow a range as would be possible for reserve aggregates—in terms of controllability therefore, reserve aggregates are preferred to monetary aggregates and narrow measures of money are preferred to broad measures

#### **5. policy design**

-for policy design purposes, the interest in the predictability of the demand for the monetary or reserve aggregate derives from the need to identify the long-run equilibrium relationship between the nominal supply of the aggregate, real income or output (real GDP) ( $y$ ), and the price level ( $P$ )

-for a monetary aggregate, this relationship is summarised by the long-run trend in velocity ( $V$ ) = nominal income or GDP ( $= y * P$ ) / nominal money supply ( $M$ )

-a similar velocity measure could be constructed for a reserve aggregate by replacing  $M$  with the nominal supply of reserves

-empirical fact is that all velocity measures are procyclical—this once again suggests that attention should be focused on the long-run trend, or cycle average, behaviour of velocity when selecting the monetary or reserve aggregate

#### **6. selection of velocity measure differs under 2 criterion**

-prior to 1980 M1 velocity was very stable in the short run and had a predictable long-term trend of approximately 3% per year, but after 1980 the long-run trend became hard to identify; M2 velocity has remained unchanged since 1980 and had a 0% long-term growth rate since 1960—moreover, in terms of long-run average trend rate of growth of velocity, M2 has historically had the most predictable pattern of all the monetary and reserve aggregates that are traditionally monitored

-the selection of the monetary or reserve aggregate differs under the 2 criteria; short-run controllability favours a reserve aggregate, whereas the predictability of the long-run average demand for the aggregate favours M2; most today favour either the monetary base or M2—although, as with the selection of the price level to be used in the design of the policy rule, monetarists agree that choosing 1 and sticking with it is most important

#### **7. growth rate (A)**

-the growth rate must be sufficient to accommodate the expanding needs of a growing economy without inducing systematic money price inflation; precisely what this rate of growth should be is determined by the long-run average demand for money

-this demand for money can be expressed in terms of the behaviour of the selected monetary or reserve aggregate as a velocity measure ( $V$ )

$$A = y + P - V$$

### ***3 Things Needed for Selection of Aggregate Expansion Rate***

1. forecast of the long-run average rate of economic growth ( $y$ )
2. prediction of the trend rate of growth of velocity ( $V$ )
3. selection of an inflation objective ( $P$ )

-once this growth rate is determined, the monetary authority should attempt to maintain it as closely as possible within the short-run; that is, no effort should be made to fine tune the economy to offset swings in the business cycle; moreover, because monetarists believe monetary and fiscal policy should be made as explicit and understandable as possible, the CGR rule that is being followed should be announced publicly

-this announcement expresses a formal commitment by the monetary authority that allows the private sector, particularly firms contemplating investment decisions, to form firm expectations of future monetary policy actions and to monitor whether the monetary authority is remaining in compliance with the stated policy

### **3. Long-Run Structural Changes and the CGR Rule**

-just as monetarists are critical of traditional stabilisation policy, non-monetarists are critical of the CGR rule

-to understand what could go wrong with CGR rules, we must look at the information used in formulating policy

#### ***2 Datas Used in CGR***

1. forecast of long-run average economic growth ( $y$ )
2. prediction of trend movements in velocity ( $V$ )

-if errors are made in either, policy errors could be made that would be systematic, permanent, and irreversible

-overprediction of ( $y$ ) and/or underprediction of ( $V$ ) would result in a systematic oversupply of money (and reserves) and lead to systematic inflation

-underprediction of ( $y$ ) and/or overprediction of ( $V$ ) would lead to a systematic deflation

-these 2 long term trends are in fact unobservable, they can only be estimated and are not invariant over time; neither trend is independent of policy—issues pertaining to the long-run effects of inflation taxes can be extreme as well

-changes in the trends represent fundamental structural changes in the economy

-if the long-run average rate of production, were to possibly increase because of a more rapid rate of technological advance or an increase in the rate of human capital accumulation, the long-run rate of economic growth would rise; if the increase were unforeseen, monetary growth would be too slow to accommodate the more rapidly growing liquidity needs of the economy—the effect would be deflationary and could restrain growth for an extended period of time in relation to what otherwise would have occurred

-similarly, fundamental structural changes in the financial markets could induce permanent changes in the demand for money; efficiency gains in the US payment systems were realised after 1973 leading to an increase in the trend rate of growth of M1 velocity; failure to accommodate the improvements in the payments system by monetary policy would lead to a systematic oversupply of money, leading to sustained inflation

-these issues cannot be fully circumvented unless the monetary authority is able to perfectly predict the structural changes and accommodate them as they take effect; their

impact can be mitigated without abandoning a monetary rule to govern policy decisions by updating ( $y$ ) and ( $V$ ) systematically as new information comes available—they could be calculated as weighted moving averages of quarterly growth rates for 7 or 8 years past, or an equation could be developed to determine when to update money rules

$$y(t) = \sum w y(t-i)$$

$$V(t) = \sum w V(t-i)$$

-where  $t$  is the date of the forecast,  $n$  is the number of quarters over the 7 or 8 year period,  $w$  is weight attached to the growth rate  $I$  periods in the past that is used for forecasting

-the weights ( $w$ ) must sum to 1, and the choice of the weights can be structured to attach more significance to the most recent observations

-these modifications allow the monetary rule to incorporate structural changes in productivity growth and in the financial markets systematically, albeit with a lag, into policy design while maintaining the principal features of the CGR rule

#### ***Principle Features of CGR Rule***

1. long-run average price stability as the policy objective, as opposed to real output or employment objectives

2. a focus on the long run in conducting monetary policy, rather short-run stabilisation

3. the absence of uncertainty about policy decisions, which are conducted according to a simple rule that can be announced publicly, enabling the private sector to monitor the monetary authority's compliance

-the weights could still be announced, and the public could easily determine how closely the monetary authority is adhering to the rule

#### **4. Financial Instability and the CGR Rule**

-many Keynesian economists would argue that these modifications to the CGR rule are simply inadequate to cope with what they perceive to be fundamental instabilities inherent in the economy, particularly in the financial sector

-their claim is that unless policy actions are taken to offset shocks quickly, and not in a systematically passive manner, the result will be large swings in real economic activity away from full-employment levels

-the Keynesian policy prescriptions apply to shocks that originate in the financial sector and to the financial markets; what happens to output when the economy undergoes shocks to the financial markets that alter the demand for money relationships in the short run?

-these shocks are characterised as deviations of actual velocity growth ( $e$ )

$$y = (V+e) + A - P$$

-if  $e$  is positive, output must rise to absorb the shock unless either prices rise to reflect fully the reduction in money demand, or the money supply decreases as reflected in  $A$

-if  $e$  is negative, output must fall to absorb the shock unless either prices fall to reflect fully the increase in money demand, or the money supply rises as reflected in  $A$

-under a CGR rule, the latter cannot occur; therefore, if prices are perceived to adjust slowly, as both Keynesians and monetarists believe, some of the financial market shock must be absorbed by output

-if one further believes that the financial markets are a major source of instability in the economy, the variance of (e) is large, then following a CGR rule allows the shocks to be transmitted directly to the real sector, leading to large swings in output and employment  
 -this all leads to the belief that CGR rule is naïve, but the proper role of monetary policy is to be ever vigilant in identifying disturbances in the financial markets as they arise and to respond by adjusting the money supply so that the policy actions buffer the real sector of the economy from financial market stability

### **5. Long-Run Consequences of an Active Stabilisation Policy**

-the principal goal of traditional stabilisation policy is to attempt to regulate economic activity to keep the economy as close to full employment as possible in the short run; the policy attempts to smooth business cycles, thereby reducing the overall level of volatility in the real economy

-does an active stabilisation policy have any consequences for long-run economic growth?—must identify the fundamental determinants of long-run economic growth and examine which could be affected by such policy

-inflation taxes could affect long-term growth, but stabilisation policy can be conducted without an inflationary bias—that is, an active stabilisation policy could be pursued while maintaining any cycle-average inflation rate, including 0%

#### **2 Factors of Economic Growth**

1. human capital

2. physical capital

?how rapidly are the factors of production growing?

-the rate of physical accumulation as determined by investment in new plant and equipment by firms

-long-run economic growth is a positive function of the cycle-average level of investment

-the interest rate, or risk-adjusted real rate of return represents the cost of borrowing to firms; higher rates lower investment as projects become more costly and thus less profitable

?what determines the cycle-average level of the risk-adjusted real interest rate that a firm must pay to borrow from investors?—ultimately, that interest rate must reflect the rate of return associated with projects the firm undertakes

-the shareholder purchases a claim to a fraction of the net income, where it is in the form of either dividends or capital gains reinvested

-the risk adjusted rate of return associated with the investment in the firm (buying a share of stock) is therefore equal to the expected PV of the income stream to the shareholder divided by the share price

-higher the discounted income stream is expected to be, the higher the price the firm can sell its stock; because investors are risk averse, the more uncertain the stream becomes, the less they can get and thus the less investment they can do; thus, uncertainty reduces long-term economic growth

-thus, the stabilisation policy must aim to reduce uncertainty; a successful stabilisation policy is one that reduces volatility in the overall level of economic activity; it thus reduces volatility in firm's sales, in NI, and then in uncertainty—consequently, the investor demands a lower rate of return, and thus borrowing increases as does investment

- from the Keynesian perspective, an active stabilisation policy has the positive effect of stimulating the long-run growth potential of the economy; monetarists believe the opposite, in that attempts to smooth business cycles will more often than not exacerbate the volatility in the economy—the greater volatility increases uncertainty and reduces investment, retarding long-run economic growth
- monetarists also stress that an active stabilisation policy requires that the monetary authority exercise discretion in the conduct of monetary policy; for investors policy discretion translates into policy uncertainty
- investors have to confront additional uncertainty, policy uncertainty, when making investment decisions
- therefore, for an active stabilisation policy to have a net positive effect on long-run economic growth requires more than just being successful in reducing the amplitude of business cycle fluctuations—the reduction in investors' uncertainty about returns associated with business cycle fluctuations must more than offset the additional uncertainty introduced by the exercise of discretion in the timing and magnitude of policy interventions in the open market that is required of such policy
- short-run stabilisation policy can affect long-run growth to the extent that it alters individuals' willingness to make long-term commitments, such as capital investment

## Inflation and Seigniorage: What is Optimal?

### 1. Inflation Taxes in the Island Economy

- opinions on the optimal long-run cycle-average rate of inflation differ markedly among economists; some say -3 to 6% and some say there is no right answer
- many agree to some desired level of inflation to support a smoothly functioning economy

- the Walrasian auctioneer, acting as the central bank, can produce any positive or negative growth rate for the money supply, assuming that households would continue to hold money willingly—money has to continue to serve as an accepted medium of exchange and store of value, that is, households have to continue to accept it in exchange for goods

- the auctioneer constructs a price index that reflects the money price of a representative market basket of all perishable goods traded on the island; the index is used to gauge how fast he should allow the money supply to expand

- question becomes that is a 0 rate of inflation optimal?

- elimination of trading friction leads to most optimal efficient allocation of the economy's resources—such allocation produces the highest level of per capital welfare or utility; anything that inhibits the optimal allocation of resources causes welfare losses

- when commodity money is used v. fiat money, one of the costs of trading is the requirement that the commodity must be held between periods; because the commodity has consumption value, the 1 period holding time raises the costs of trading and the £ of trades is reduced—the commodity is assumed not to increase in value over the period to compensate the household for postponing consumption

- an analogous cost is incurred by the household in a fiat money economy in a 0 inflation environment (although without the direct resource costs)

- households will produce goods today to acquire goods tomorrow—they hold their wealth in the intervening period in the form of money that does not increase in value, leaving them uncompensated for having postponed consumption for 1 period

- households therefore have the incentive to reduce their idle money balances; however, because money is the sole medium of exchange in the economy, it is needed for the purchase of market goods—this coincided with the cash-in-advance view of money demand that emphasises the medium-of-exchange property as a singular feature of money
- a reduction in the stock of intertemporal money holdings is accompanied by a reduction in the volume of monetary transactions—hence, the volume of trade in the economy declines; households reduce their respective consumption of market goods to suboptimal levels and the welfare, or per capita utility level, of the economy declines

- these decisions are accompanied by a reallocation of capital and labour resources; exactly how much the welfare level declines and how the resources are reallocated as a result of the economic distortion is determined by the options available to the households that could mitigate these costs—that is, they depend on the margins along which households are able to adjust when making their decisions; for example, households

could reduce consumption and increase leisure in a manner consistent with an intratemporal preference shock

-the greater the households perceives these costs to be the greater the magnitude of their response will be; if a household can get 1 unit for 1 dollar this period and next period, they will always take this period over next; it always prefers consumption today over consumption tomorrow

-if they will take 1.01 units in exchange for 1 dollar next period instead, the personal household discounts the future at a rate of 1% per period; the higher this personal discount rate. The greater the costs of monetary transactions to the household, because it must postpone consumption without compensation by holding money that is just maintaining a constant purchasing power over time

-this cost of holding money arises when more goods can be purchased this period rather than next; for this cost to be eliminated, the value of the money must increase next period relative to the goods—“there is a cost to holding on to the money, because you get less the longer you hold it” ; example uses a marked bill which will be redeemed for more next period—How much more do you need next period to hold off to buy until next period and hold onto your money

-in order to reduce or eliminate this cost to the households, the auctioneer must reduce the money supply each period in order to maintain a 1% increase in the value of the money; relative scarcity is what produces economic value, so for money to increase in value over time it must be becoming more scarce in relation to the supply of goods

-to completely eliminate this cost of holding money intertemporally, the rate of reduction of the money supply must be sufficient to reduce the money price of goods by 1% per period—households are no longer penalised for holding money intertemporally, because the money is gaining in value at exactly the rate at which they are discounting the future

-if the money supply were contracted at a more rapid rate than the rate of discount, money becomes too scarce, households would want to hoard money rather than trade it for goods, and the fiat money equilibrium would collapse—the economy would return to barter

-therefore, there is a limit on the minimum rate of growth the Walrasian auctioneer is permitted; there is an inflation tax; in this context, the optimal rate of inflation is therefore determined by preferences; it corresponds to Friedman’s optimal deflation rule: in the absence of other distortions in the monetary economy, the rate of deflation that restores Pareto optimal allocations of resources, thus rendering the highest per capital utility or welfare level possible, is equal to the rate at which households discount the future—this also corresponds to a 0 nominal interest rate, which makes households indifferent between holding money and holding other forms of wealth

**\*inflation taxes**- any growth rate (positive,0,negative) that is above the minimum imposes costs on households because they are no longer fully compensated for holding money intertemporally; can be positive even in a deflationary environment

## 2. Price Level Stability

-some economists view that the optimal rate of inflation is 0; they place a premium on price-level stability; this argument is based on the empirical fact that prices become more volatile as the inflation rate increases



- changes in relative prices therefore reflect changes in the market valuations of goods, such that the supply and demand factors in 1 goods market have been affected differently from the supply and demand factors in another market
- inflation refers to the rate of change of the money price of a market basket of goods such as the CPI
- by regulating the supply of money, the monetary authority is able to determine the average rate of inflation over a time interval corresponding to, say, the average length of the business cycle; what the preceding empirical fact suggests is that the closer this rate of inflation can be brought to 0, the more stable relative prices will be
- ?is greater stability in relative prices desirable?
- when the general price level is stable, and the long-run average rate of inflation is 0, the economy experiences real shocks in the form of supply and demand disturbances that are either specific to individual markets or aggregate shocks that differentially affect various markets—in response to these shocks, relative prices change; a firm realises productivity gains (perhaps larger than expected) because of technology improvements or better worker training; the gains lower the firm's market price of goods relative to other firms, and households then shift consumption to that firm's goods, possible because of successful marketing campaigns or changes in consumer preferences—the relative market price of firm's good has risen
- changes in relative prices will affect the firm's investment and production decisions—the firm must determine why the price change occurred, which could be because of many different reasons, and the firm's response to various shocks may be different if it were certain of the cause; the firm has a signal extraction problem—the firm has only 1 price signal that has many potential causes, and can only imperfectly resolve the price changes into an ultimate source; as a result, the firm will inevitably make mistakes in production and investment decisions
- the mistakes are ultimately reflected in the firm's value and hence in the return to shareholder's investment; larger the mistakes, lower the return; consequently, household's require higher real interest rates (risk premium) to compensate them for undertaking risk, which raises the cost of borrowing to the firm, which in turn reduces its long-run average level of investment in new plant and equipment—in sum, there are costs associated with a high degree of variability in relative prices
- the complete elimination of relative price changes is neither desirable nor possible; the production and investment decisions firms make in response to relative price changes represent the way the economy's resources are reallocated toward their best use; the empirical fact that the price signals on which those decisions depend are imperfect predictors of future supply and demand conditions is unavoidable and represents an essential degree of risk a healthy economy must incur
- this empirical fact suggests that as inflation rises, the signal extraction problem becomes more difficult for firms to resolve; mistakes are amplified and the level of risk incurred by households when making investments in the firms rises; the mistakes lead to a misallocation of the economy's resources; from an economywide perspective, correcting the mistakes is costly as capital and labour must be redeployed in the economy; moreover, firms invest less in new plant and equipment, which reduces the rate of expansion of productive capacity in the economy, thus retarding growth

-price-level stability, or 0 inflation, thereby reduces the unnecessary noise in relative price changes and minimises the attendant adverse consequences for investment, growth, and welfare

### **3. Labour Market Rigidities and Moderate Inflation**

-households offer labour services to firms in exchange for labour income; in general, labour supply and demand decisions are based on the level of the real wage

-however, many economists (Keynesian) believe that prices are sticky in the short run; the presence of long-term nominal wage contracts is 1 reason frequently given for nominal wage rigidity

-when the price level is flexible and nominal wages are not, shocks to the economy that alter the price level may induce changes in real wages that require employment levels to adjust if the labour market is to clear at full employment; however, contractual arrangements may preclude such adjustment from taking place over the duration of the contract

-as nominal wage rigidity is an important factor influencing macroeconomic fluctuations, what impact does a moderate rate of inflation have on the economy when nominal wages adjust slowly

-empirical fact that the general price level, measured for example by the CPI, becomes more volatile as the inflation rate rises

-as such, at higher rates of inflation, real wages become more volatile but also more flexible; on the negative side, the purchasing power of nominal wages becomes less predictable—households therefore are incurring a greater degree of risk associated with the return they receive for labour services; to incur that risk, households would require a higher nominal wage, which would raise labour costs to firms and would lead to a suboptimal level of employment through both a substitution of capital for labour and a reduction in output

-moreover, to the extent that the volatility in the general price level does not reflect the industry-specific changes in productivity, the greater flexibility in real wages achieved by a moderate inflation is actually detrimental to the efficient allocation of labour resources

-inflexibility in nominal wages could be asymmetric; when contracts are renegotiated, nominal wages can rise, but there is resistance to an outright decline nominal wages

-reasons given for the asymmetry include ignorance of the general level of prices on the part of the worker, often referred to as money illusion, and a perception of fairness—that is, the employer has no control over the general price level and can therefore do nothing about the inflation rate, but does have direct control over the nominal wage paid to employees; a cut in nominal wages may therefore be seen as less fair than an increase in the inflation rate, even though the effect is the same: real wages decline

-if asymmetry in the degree of flexibility of nominal wages were present and significant, a moderate amount of inflation, say 2 to 5 percent, could enable firms to lower their real wages more easily in the event that productivity declined; thus labour could be allocated more efficiently across the economy and welfare would be improved

#### 4. Seigniorage

-governments must raise revenues to fund government expenditures; to raise revenues, they must either impose taxes or issue debt; if it issues debt, it incurs a stream of liabilities associated with repayment

##### *2 Ways to Meet Liabilities*

1. dedicate future tax revenues to repayment
2. debt can be monetised- revenues are especially funded with inflation taxes; inflation taxes arise from the government's monopoly control over the money supply, and the revenues they generate are termed seigniorage

**\*printing money**- raising revenues through seigniorage or inflation taxes; US government needs 1 billion but does not want to raise taxes—the Treasury issues 30 year bonds instead—the owners could be the Federal Reserve or private citizens (both get payment streams)

##### *Process*

1. the Federal Reserve pays back monies received to the Treasury after paying expenses, so the cost appears to be 0 and no taxes had to be raised
2. this cost is actually borne by households, as the money paid to the Federal Reserve in open market operations increases bank reserves and the money supply rises
3. the cash goes to the company, now more money is in the economy; the only way for inflation not to occur is for the Federal Reserve to take the money paid by the Treasury (profits) out of circulation instead of paying back to the Treasury
4. if the excess reserves to total bank reserves ratio and the currency deposit ratio were relatively stable, the open market operation would correspond with an increase in the demand for currency in the economy
5. with the Federal Reserve's monopoly over the supply of currency (legal tender), the Federal Reserve would meet this increase in demand simply by printing money
  - the costs are borne by everyone who engages in monetary transactions—that is, money becomes less scarce and is valued less in relation to goods, whose prices rise; consequently, the inflation taxes were imposed on monetary transactions and the collection of those inflation taxes or seigniorage from households financed the purchase
  - viewed from the perspective of the public finance of federal government expenditures, the question of determining an optimal rate of inflation is couched within the context of where the incidence of inflation v. alternative forms of taxation falls
  - the questions of whether distortions in private decisions that inflation creates have a greater or lesser effect on welfare, than capital or labour income taxes for example are ambiguous
  - the full general equilibrium effects of any tax are difficult to identify, much less to quantify; moreover, inflation taxes are even more elusive than others
  - when inflation taxes impinge only on the monetary transactions associated with the purchase of consumption goods, as in the island economy, the welfare losses of moderate inflation may not be as large as those associated with capital or labour income taxes that are sufficiently high to raise the same amount of government revenue—the efficiency losses are significant, but less than those associated with income taxes
  - however, as the inflation tax rises and becomes ever more persistent, households respond by allocating resources toward devising alternative nonmonetary means of payment; an increasing share of the economy's resources may be diverted into unproductive activities

in the financial services industry and away from production of goods, from which households derive direct utility, and away from research and development activities, which produce improved technology, or away from training, which is a source of enhanced worker productivity, and the long-run growth potential of the economy declines—inflation losses have the potential to drain produce large welfare losses by draining resources from production and R&D; as a result, output falls, the economy is placed on a slower growth path, and welfare may be substantially reduced

- households may also want to hold money for precautionary reasons, to smooth their levels of consumption over time if their income stream is volatile—to the extent that the precautionary motive for holding money is significant, high and volatile inflation rates induce larger precautionary taxes to the point where they could exceed the costs of a tax on labour income that is significant to raise the same amount of government revenue
- the determination of long-run inflation rate is a matter of government policy—many different countries all over the world have had widely divergent inflation policies and widely divergent rates of inflation

- some economists have attributed the choice of high inflation regimes to inefficient tax collection systems that foster tax evasion and high collection costs, as the high costs tilt governments increasingly towards seigniorage as a principal source of revenue

- inflation in the US where voluntary tax compliance is high has been below Italy, where tax evasion is widespread

- political instability could also frustrate the governmental decision-making process when legislative action is required to raise tax revenues; the government then turns to inflation taxes by default; political instability could also foster or simply reflect an environment in which tax evasion is pervasive and the cost of collecting taxes is high

- from a general equilibrium perspective, to eliminate inflation taxes completely the monetary authority would have to follow Friedman's rule, which produces a deflation equal to the personal rate of discount (or equal to the real, risk-adjusted interest rate on capital)

- any faster monetary growth would penalise persons who hold money intertemporally and who, in their effort to avoid the tax, would alter their decisions in ways that lead to a misallocation of the economy's resources and to a reduction in welfare; an alternative perspective on inflation emphasises the value of price stability in reducing the risk investors face when trying to assess the value of alternative investments

- empirical evidence suggests that higher inflation rates coincide with more variability in relative prices and therefore more uncertainty for firms in making their production and investment decisions, and consequently result in larger mistakes being made in those decisions—hence, a 0 inflation environment becomes the desired goal, it removes a deterrent to investment and stimulates long-term growth and raises economic welfare

- another view centres on a perceived advantage associated with moderate inflation in allowing real wages to become more flexible downward in the event that nominal wages are relatively inflexible downward—such flexibility may allow labour resources to be reallocated more efficiently in the economy in response to real shocks that differentially affect sectors; again, the efficiency gains would lead to welfare improvements

- finally, some economists view inflation from the perspective of public finance, seigniorage collection by the federal government associated with inflation taxes is

perceived to be a substitute for revenues collected from other forms of taxation—the relative costs and benefits of relying on this source of revenues must therefore be evaluated and may in fact vary across countries

-viewed in isolation, each of these arguments has merit-when they are taken together however, the extent to which economies are penalised by some moderate levels of inflation is unclear

-Ireland (1998) attempted to evaluate the relative merits of the Friedman Rule, price-level stability, and moderate inflation in a single general equilibrium model with sticky prices; he concludes that on balance a negative inflation rate is optimal in the long run and PV of the costs of quick adjustment from a higher level to the optimal level is lower than that of a slow adjustment

-opinions among government leaders as to what the optimal rate of inflation is; even when the current inflation rate exceeds the optimal inflation rate, the question remains as to whether the PV of the costs of reducing inflation to a predetermined level that is seen to be optimal exceeds the PV of the benefits

# V. The Mechanics of Policy and Policy-Making

## Optimal Targeting and the Response of Financial Markets

### 1. Stabilisation Policy and the Choice of an Intermediate Target

-monetary policy is assumed to bring about the money supply changes without significant error, but the monetary authority does not control the money supply directly, regardless of how 'money' is defined

-instead it has policy tools to manipulate the nominal money supply: reserve requirements on certain bank deposits, discount rate charged to members, and open market operations that determine the rate of expansion of bank reserves in the US

-policy goals are not as clearly defined as policy tools however; could involve many forms, but usually follow macroeconomic objectives associated with output, employment, and prices

-therefore, in practice, the monetary authority cannot conclude its policy analysis by relating changes in the money supply to ultimate changes in the macroeconomic variables in which its policy objectives are stated, but rather must relate quantitative changes in the policy tools to the macroeconomic objectives; knowing how rapidly a monetary aggregate is growing is not enough, they must also know how rapidly to expand the money supply to sustain that growth

-there is a mechanism that links changes in policy tools to changes in the macroeconomic variables in which the policy goals are defined; this mechanism that links policy tools to policy objectives includes both the money supply process and the behavioural relationships that ultimately establish the macroeconomic relationships between money and the real economy—important in this linkage are the practical problems due to lags in the economy's response to policy changes

-the lags give rise to the use of 'intermediate targets' in the short-run conduct of monetary policy, whereby the policy objectives are translated into a value for the growth rate of a selected monetary aggregate or a level of a market interest rate; that value is then treated in the short run as though it were the policy goal itself

-the monetary authority is limited in its selection of its policies by the fact that its policy tools are not independent of each other—the 3 policy tools work together to form 1 effective policy tool

-the scope of monetary policy is thus restricted to addressing only 1 policy objective at a time, or at best, a tradeoff between competing policy objectives such as short-term economic growth and inflation

-the optimal selection of a policy target involves the choice between a monetary target v. an interest rate target; because the choice of a target and the numerical values selected for the target are premised on assumptions about behavioural and institutional relationships that affect money demand, the monetary authority needs to identify changes in those relationships that could affect its ability to achieve policy objectives—to help identify these changes, the monetary authority monitors a host of information variables, often drawn from the financial markets, which historically have presaged some important changes in the macroeconomic variables that constitute its policy objectives

-monetary policy has a very strong influence on the financial markets in the short run; and consequently participants devote a large portion of their time to anticipating policy decisions before they are actually implemented; thus, when information arrives to the financial markets that alters expectations of future monetary policy, asset trading occurs that considers the new information into asset prices and interest rates

-this trading can lead to a seemingly perverse reaction of financial markets a selloff on goods news or a rally on bad news; the viewing of news events in the context of a likely monetary policy response is what precipitates such reactions

-the objectives of monetary policy are stated in terms of numerical values for macroeconomic variables such as output, employment, and prices—these numerical values become the goals of policy; the policy goals are related to numerical values of monetary aggregates and interest rates by a complex set of behavioural and institutional relationships that effectively determine the aggregate demand for money—to the extent that the relationships are stable and predictable, explicit policy goals can be translated into desired numerical values of selected monetary aggregates or interest rates

-example: targeting 4% Fed Funds Rate or 3% M2 growth rate lead to a long-run average inflation rate of 1% -- which intermediate target is correct (market interest rate or monetary aggregate)

?operational issue for the Fed is under what conditions is a monetary aggregate preferable to a market interest rate target?

-the choice of an intermediate target may be influenced by the choice of policy objectives and whether those objectives are short term or long term; if the long-run demand for money is not seen to be predictable, an interest rate target may be preferred; if the long-run money demand relationship is perceived to be stable, a monetary aggregate as the intermediate target may be preferred (nominal target used to achieve a nominal objective)

***short-term concerns also play roles in the selection of an intermediate target***

1. while pursuing long-run objectives, the monetary authority may give some weight to the effect that the selection of the target may have short-term volatility in output and employment

2. the policy may be short-term in nature; traditional stabilisation policy where the objectives are to keep the economy as close as possible to full employment while maintaining stable prices

## ***2 Generic Macroeconomic Shocks***

### **1. productivity shock**

-reflects a change in the technology used in producing goods; given that such shocks are permanent, the appropriate policy response is to accommodate them fully

## **2. preference shocks**

-could be intratemporal or intertemporal; because they are transitory, the appropriate policy response is to ignore them if they dissipate quickly or to offset them if they persist beyond the time horizon for which the policy is being designed; for shocks that dissipate quickly, the short-term effect on the economy is to produce fluctuations in employment and output around their respective full-employment levels

?can the choice of an intermediate target by the monetary authority minimise the fluctuations?

-intra-temporal and intertemporal preference shocks yield similar results when dealt with by nominal money supply targeting or interest rate targeting

-nominal money supply targeting is preferred to interest rate targeting when the uncertainty the monetary authority faces is from transitory shocks to the goods market (*sluggish price adjustment*)

-interest rate targeting is preferred to money supply targeting when the uncertainty the monetary authority faces is from transitory velocity shocks (*could be described as a 3<sup>rd</sup> type of generic preference shock that reflects unexpected changes in the rate of adoption of new technology in payment systems by households*)

## **Money Supply Targeting**

-if the monetary authority believes there is less stability in the goods (and labour) markets associated with transitory preference shocks (also applies to transitory productivity shocks) than in the money market due to transitory velocity (or money demand) shocks, the nominal money supply is the optimal intermediate target that minimises the magnitude of short-term employment and output fluctuations about their full-employment levels

## **Interest Rates Targeting**

-if the velocity shocks induce less instability into the money market than preference shocks in the goods market, interest rates are the optimal target

## **2. Policy Instruments and Policy Tools**

-once the intermediate target is chosen, the monetary authority must take into account the money supply process when attempting to hit its target

-the choice of the policy instrument is between a reserve aggregate (non-borrowed reserves) and a market interest rate (fed funds rate)

-the monetary authority achieves its intermediate targets through an average over a several-week time period: uses either of the 2 policy instruments to achieve the intermediate targets

-the monetary authority is able to observe the behaviour of the alternative policy instruments closely by monitoring the activities in the very active market for bank reserves (fed funds market);

-the implementation of policy can be focused narrowly on achieving numerical values for the policy instruments in a timely way; but those numerical values are usually subordinated to the intermediate targets—that is, there is a continual feedback of information on whether the targets are being met; if they are not, numerical values for the policy instruments are likely to be adjusted accordingly



*-the policy instrument is to the intermediate target as the intermediate target is to the policy goal*

### **Linkage Process**

#### **3 Policy Tools**

1. reserve requirement ratios
2. discount rate policy
3. open market operations

#### **2 Policy Instruments**

1. reserve aggregate (non-borrowed reserves)
2. market interest rate (fed funds rate)

#### **4 Intermediate Targets**

1. monetary aggregate
2. market interest rate (fed funds rate)
3. inflation rates (price level)
4. exchange rates

#### **3 Policy Goals**

1. output
2. employment
3. inflation

#### **Information Variables**

-structural lags require monitoring of the link between intermediate targets and policy goals via these information variables

1. yield curve
2. commodity prices
3. exchange rates

-as with other countries, the US does not perfectly control the volume of nonborrowed reserves in the banking system or the value placed on reserves in the market (fed funds rate), but it can determine those values very closely on average over a relatively short period of time by manipulating its policy tools

#### **Alter Demand**

1. changing reserve requirements
2. changing discount rate

#### **Alter Supply**

1. can alter supply of reserves by conducting open market operations

-there are limits on what those policy tools can accomplish; they are all essentially operating in a single market—the market for bank reserves

-the choices for the 3 policy goals must be coordinated; a discount rate policy cannot be independent of the policy governing open market operations, the 3 policy tools must work together toward achieving the same end; the Fed has only 1 effective policy tool at its disposal, which implies the Fed can only focus on 1 policy goal at a time

-the Fed cannot attempt to achieve both high employment and low inflation (in the short run) at the same time—therefore, the Fed is often forced to choose between conflicting policy goals

### 3. Federal Funds Market

- the federal funds market is an interbank market for bank reserves
- banks have VC and RC for TR; these are the only 2 non-interest bearing accounts the bank has (except for buildings and equipment)
- banks do not want to hold excess reserves beyond that needed for normal operating activities resulting from currency demand by their customers or check clearing—much of this is actually done through their Federal Reserve accounts
- banks will want to channel any extra reserves toward working assets that generate income; for 1/3 of the roughly 11,000 US banks (75% total assets in banking system) have excess reserves to lend
- an important consideration in the bank's management of reserves is the volatility imparted to its reserves holdings by unexpected net withdrawal demands by the public; could reduce the bank's reserves below reserve requirements
- prior to 1960 the principal methods of addressing that problem was to hold highly liquid short-maturity assets such as US T-bills (low yielding), which could be liquidated on short notice to raise reserves as a precaution to unusually high net withdrawals
- the correlation of net positive or negative withdrawals across banks is far below unity; the federal funds market developed to allocate reserves across the banking system—since 1960 the fed funds market has become the principal avenue by which reserve-deficient banks can reliably meet reserve requirements—consequently, excess reserves and banks' holdings of US government securities have fallen substantially as a % of total assets in the banking system
- the efficiency of the fed funds market operations' is that the transactions are conducted over Fedwire, which is part of the electronic payment system operated by the Federal Reserve; the deposit balances are kept at the Fed and added to VC for TR; therefore, reserves can move from one bank to another very quickly, cheaply, and in large volumes by a simple credit and debit to the respective accounts by the Fed
- in the late 1980s, many banks once again raised their government securities holdings, principally to improve asset quality after the problems of the banking industry during the mid-1980s that resulted in a large number of bank and thrift failures
- 3 parties involved: the 2 banks and the Federal Reserve; set contract terms of duration (overnight – 3 days) and price (interest rate, federal funds rate); since they are both liabilities to the Fed, its balance sheet doesn't change, only the participating banks' do
- rates rise and fall on basic supply and demand conditions: whether more or less banks have excess reserves
- the federal funds rate that is the principal focus of monetary policy, when it is selected as the policy instrument and/or as the intermediate target, is a sample average of rates charged on overnight loans, which is called the effective federal funds rate
- when banks are managing reserves very closely, their ability to extend credit may be a very sensitive indicator of the economy's overall credit conditions; in that case, the Federal Reserve is able to have a significant influence in the credit markets by altering the supply of and/or demand for bank reserves through manipulation of its 3 policy tools

### **No Actual Money is Exchanged or Exists- all computer based**

-when the Fed performs open market operations and buys securities in the open market, it (ultimately) pays for them simply by crediting the deposit accounts that the commercial banks hold with it, thus increasing the bank's reserves—this allows the banks to lend out more of their VC to customers

-increases in bank's reserves due to open market operations induce a decline in the federal funds rate and tends to ease credit conditions; a cut in the reserve requirement ratio has similar effects on the federal funds rate and the credit markets by reducing the demand for bank reserves; the effect of a cut in the discount rate is less clear

### **4. Discount Rate Policy**

-1 of 2 options for banks to borrow when they are short of reserves; discount window

-the tighter the federal funds market, the higher the federal funds rate and the more likely the bank will be to turn to discount window borrowings; the attractiveness of borrowing at this window can be altered by the Federal Reserve when with the discount rate policy

-the Federal Reserve is the lender of last resort, and makes short-term adjustment loans to banks short on reserves; these loans are not a permanent source of funding, and the duration is usually overnight, never more than 3 or 4 days for loans to small banks

-some longer term loans known as extended credit are Federal Reserve loans to troubled banks undergoing a restructuring of their assets; these loans are made in unusual circumstances and the total volume is generally small; the Fed also provides seasonal credit to banks to support seasonal fluctuations in credit demand arising principally from agricultural production needs such as planting and harvesting

-the Fed discourages excessive borrowing by individual banks and attempts to regulate the total volume of borrowing for the banking system as a whole

#### **2 Aspects of Discount Rate Policy to Achieve Borrowing Objectives**

1. discount rate-higher the discount rate lower the borrowings

2. spread- between federal funds rate and discount rate

-spread is usually positive; in equilibrium however, banks must perceive the marginal (per dollar) cost of raising funds in the federal funds market to be identical to the marginal cost of borrowing at the discount window—the discrepancy between those 2 rates is due to the fact that banks that over utilise the discount window may become subject of additional regulatory oversight or regulatory pressure

-Fed can micromanage the banks if the bank's actions are inconsistent with safety and soundness criterion; the Fed seldom relies on these extreme measures; an early warning sign is excessive reliance on adjustment credit loans—the Fed will just voice its displeasure and urge the bank to address the root causes of their chronic reserve deficiencies

-each of the Federal Reserve District Banks operates a discount window for banks in its district; the discount rates across the Federal Reserve Banks are determined by the Board of Governors and nearly always uniform across districts

-the extent to which the Fed applies such regulatory pressure is a matter of policy; at the micro level it is intended to preclude individual banks from adopting lax policies, and at the macro level it is intended to be used as a signal of monetary policy itself and whether the Fed is leaning more or less toward easing credit restrictions (for example)

- the signals are often subtle changes that take place over an extended period and culminate in a discount rate cut
- abrupt changes usually accompany changes in open market operations, which in turn are reflected in the federal funds rate

### **5. Monetary Target Cones and Base Drift**

- since the mid 1970s the Federal Reserve has been providing Congress with targets for selected monetary and credit aggregates—the targets currently consist of upper and lower growth bounds on M2 and M3 rates and a monitoring range for total private nonfinancial debt, which produce target cones within which the nominal value of the aggregate is expected to remain
- the Fed reports these targets semiannually to Congress to provide some accountability for monetary policy decisions; the targets represent the Fed's forecast for monetary growth consistent with its policy goals, and the policy goals reflect the Fed's general view of the current state of the macroeconomy and are incorporated into its forecast of economic growth and inflation—this forecast is also contingent on future monetary policy decisions
- the target cones represent the Fed's best guess of the monetary growth rates that will support its contingent forecast for economic growth and inflation—consequently, monetary growth above the upper bound is expected to be too inflationary, whereas growth below the lower bound is expected to slow the economy unduly as a result of excessively tight credit conditions
- the Federal Reserve is not obligated to keep the aggregates within their respective target cones; if economic conditions appear to change so that the target cones are no longer consistent with policy goals, the monetary targets can be abandoned—when the disconnection between monetary policy decisions and target cones occurs with regularity, the target cones themselves have no meaning
- in this situation, the target cones provide neither the information for congressional oversight nor the discipline for Federal Reserve policy decisions, which are always susceptible to myopic overreaction to short-term transitory events
- in the 1970s the Fed reported target cones to Congress, but subsequently ignored them; the Fed misjudged the impact of the macroeconomic shocks that affected the economy during the period and systematically oversupplied money leading to high inflation (shocks included oil and labour supply associated with demographic changes and more women entering work force; led to excessive money creation)
- therefore, when the Fed returned to Congress to report on monetary policy, monetary growth was consistently above the target cones; the response was simply to ignore the old target cone by repositioning the apex of the new target cone at the current level of the money stock—this approach was repeated through the late 1970s, during which time the target cones were rendered essentially meaningless
- \***base drift**- letting bygones be bygones; new target cones are always selected to accommodate fully the past movements of the monetary aggregates regardless of the extent to which they may have drifted beyond the old target ranges
- during the 1970s, when the short-term pressures on the Federal Reserve were toward policy ease, the practice of base drift coincided with a practice of systematically oversupplying money, with the subsequent runup in inflation

## **6. Monetary Aggregate Targeting and the Response of the Financial Markets to the Weekly Money Supply Announcements**

- by 1979, inflation in the US had reached double digits, and many short-term market interest rates exceeded 20%; the Fed abruptly changed policy and its principal objective became reducing inflation
- to achieve this goal, the Fed switched from interest rate targeting (federal funds rate) to explicitly targeting the money supply, with particular focus on M1; the implication was that the target cones the Fed had been announcing to Congress were now to become meaningful indicators of future monetary policy
- the financial markets also began to scrutinise each week the aggregate monetary supply figures released by the Fed each week for trading purposes
- thus, when the Fed is following a credible monetary policy whereby it is explicitly targeting a monetary aggregate, the weekly money supply figures contain important information relevant to future monetary policy decisions
- when the money supply turns out to be higher than expected, the financial markets are likely to lower their expectations of future monetary growth (tight future growth), which results in a selloff in the stock and bond markets; if the money supply figures are lower than expected, the markets are likely to revise their expectations of future monetary growth upward (expansionary future growth), and bond prices and stock prices rise on the news

## **7. Less than Complete Aggregate Targeting and the Response of the Financial Markets to Other Macroeconomic News that Could Alter Monetary Policy**

- by 1983 the Fed had begun to lose confidence in the macroeconomic relationship between M1, income, and interest rates; DIDMCA 1980 reduced the stability of M1, and the Fed could no longer formulate meaningful targets for M1 that reflected its ultimate policy goals of price stability and sustained economic growth- the Fed moved away from M1 targeting, and the weekly money supply announcements became less important on Wall Street because the validity of the information was waning
- the weakening in the feedback from the intermediate target of M1 growth to the policy instrument, which at the time was nonborrowed reserves, increased the direct sensitivity of monetary policy to other macroeconomic news events; that is, those events did not necessarily have to show up in M1 growth (the target) for nonborrowed reserves (the instrument) to be affected by open market operations—the same was true of the subsequent policy regime of M2 targeting with a borrowed reserves instrument
- the financial markets began to adjust their trading activities increasingly to reflect their expectations of how the Federal Reserve would react to various macroeconomic shocks

### **Worse than Expected Performance**

- bad news on the economy translates into good news on Wall Street, but only because the markets expect the Federal Reserve to alter its monetary policy in light of the news
- the Fed would therefore expand money and credit further, thereby reducing interest rates and raising stock and bond prices—in the absence of monetary policy response by the Fed however, stock prices would decline, reflecting weaker anticipated future earnings

### **Better than Expected Performance**

- when PPI numbers are less than expected, the markets expect the Fed to somewhat relax its effort to reduce inflation and focus more on stimulating economic growth
- the change in the expectations of future monetary policy would tend to support higher stock prices, which may otherwise have fallen if the lower PPI numbers were interpreted as indicative of a weaker economy
- bond prices are likely to rise on the expectations of lower interest rates
- in both cases the time frame for restoring M1 to its target range will be lengthened, because policy responses result therefore increasing the reequilibrating time
- in both cases, the *changes in expectations of future monetary policy* results in higher stock and bond prices (psychology effect); both ostensibly result in quicker expansion of money and credit because the ostensibly correct policy action brings the markets to equilibrium

### **8. Transition Back to Federal Funds Rate Targeting**

- between 1983 and 1989 the Fed moved away from explicit targeting of the money supply; M1 behaviour become so erratic during the phase-out of interest rate ceilings on deposit accounts that it was abandoned altogether and the Fed discontinued its reporting of an M1 target cone to Congress—the principal monetary aggregate became M2
- M2 velocity is more volatile than M1 velocity, and therefore the Fed continued to lessen its reliance on the monetary aggregates and increased its reliance on projecting reserve growth more directly—this practice became more pronounced that many economists proclaimed that the Fed was actually targeting reserves during this period and ignoring the monetary aggregates altogether

#### ***2 Reasons for Policy Instrument Switch from Nonborrowed to Borrowed Reserves***

##### **1. interest elasticity of M2 is substantially lower than M1**

- thus, when M2 velocity (or money demand/supply) shocks occurred that the Fed wanted to offset to meet its target, larger changes in total reserves were required; under a nonborrowed reserves instrument, those shocks would have to be absorbed by changes in borrowed reserves, which are only a small fraction of bank reserves
- to avoid erratic swings in discount window borrowing, the Fed chose to switch to a borrowed reserves target, thereby fixing the desired level of borrowings; under that procedure, the velocity shocks were fully accommodated by open market operations and thereby absorbed with changes in nonborrowed reserves

##### **2. short-term interest rates became more volatile, which translated into greater volatility in the spread between the federal funds rate and the discount rate**

- however, for a given discount rate, the Fed's open market operations policy could be used to determine the federal funds rate and hence, the spread between the 2 interest rates; over time the desire to reduce short-term interest rate volatility began to play an increasingly prominent role in the policy decisions themselves, as the role of the monetary aggregates diminished

- when the short-run relationship between M2, interest rates, and output also began to deteriorate in 1989, the Fed felt it could no longer rely on the demand for M2 to guide monetary policy decisions; money supply targeting was abandoned and the Fed returned to its pre-1979 operating procedures of explicitly targeting the federal funds rate

- the operating procedure is to use borrowed reserves as the policy instrument by estimating the reserves need associated with a given federal funds rate and accommodating that need with nonborrowed reserves on a biweekly basis, which is the length of the reserves maintenance period
- interest rate targeting between 1973 and 1979 was not productive; the Fed was trying to depress short-term interest rates artificially in an effort to stimulate the economy—as a result, the Fed systematically oversupplied money resulting in double-digit inflation leading many to question whether the Fed can effectively target interest rates
  
- to implement monetary policy, the Fed must first decide in its policy goals for the macroeconomy; policy choice depends on objective choice and time frame
- policy goal can be either long-term to minimise unemployment and stabilise price level or short-term to minimise the short-term fluctuations around those long-term objectives
- interest rate targeting or money supply targeting will be preferable depending on the situation
- because policy goals respond with lags, the selected value for the intermediate targets must reflect those lags; tries to hit that target exactly; can't directly control the target, but uses the policy tools to achieve that target
- these policy tools all operate on a single market, the market for bank reserves, the federal funds market—therefore, the monetary authority must coordinate the use of the tools to affect the equilibrium in that single market-has only a single effective policy tool

## Desk Operations and the Repo Market for Treasuries

### 1. Repurchase Agreement

- weekdays at 11:30 AM the Fed conducts open market operations; these operations determine the rate at which the central bank's portfolio of government securities is allowed to expand
- the Federal Reserve is not limited to a single intervention a day, but it is common protocol
- the vast majority of daily open market operations do not involve outright purchases and sales of government securities; instead, the Fed relies on temporary holdings of claims on government securities (repos, RPs)
- under an RP, the Fed acquires a claim on a T-bill, for a duration as short as overnight to as long as 15 days—in exchange for the claim, the Fed creates base money, or it adds to the monetary base by increasing reserves to the banking system (all computerised, no money is exchanged, banks can just lend more of their VC)
- when the repo date expires, the Fed returns the Treasury security to its counterparty, thus extinguishing the claim on the T-bill and erasing the base money liability it had created and bank reserves return to their previous levels
- matched sale purchases MSP are used when the Fed wants to temporarily drain reserves from the banking system; opposite from RPs
- only when the Fed wants to permanently add to its portfolio of government securities does it engage in outright purchases of Treasury securities; in the long-run, outright purchases are necessary to provide sufficient reserves for the banking system to meet the growing liquidity needs of the economy
- the repo market must be highly liquid for the Fed to rely on it for implementing monetary policy decisions; makes it its primary mechanism
- that is, the repo market must fulfil an economic need that is independent of the Fed's open market operations—that need is created on 1 side of the market by large investors, such as mutual funds and commercial banks, that are seeking very liquid investments, and on the other side by government securities dealers and some commercial banks that are seeking financing for their inventories of government securities
- government activity in this market is a small proportion; 10 billion of 500 billion daily
- a repo agreement can be described as either a short-term collateralised loan or as a short-term investment; 2 transaction deal, with interest spread on repayment the price for the use of the funds
- the government securities dealer would issue the RP and send securities, collateral, to the money market mutual fund; the mutual fund is then said to be doing a reverse RP—that is, sending funds to the government securities dealer and reversing in securities, which become assets of the mutual fund; the following day the RP expires and the mutual fund returns the collateral, whereas the government securities dealer sends the funds, including interest payments, to the mutual fund



-transaction costs are very low because of the automation in the process; government securities dealers are market makers for government securities, which means they stand ready to buy or sell securities at preannounced prices; they must finance their inventories of government securities at all times and a principal source of the financing is the RP market; they get them from large institutional investors who enjoy the safe, liquid, short-term return

-legally, there is neither a fish nor fowl aspect to RPs, in that which party actually owns the security in case of bankruptcy by the issuer of the RP has not been clearly established; if the RP is seen to be a collateralised loan, the lending party may not receive full compensation for the loan because that party becomes one of many claimants to the assets of the bankrupt firm; however, if ownership of the security is transferred under the terms of the RP, in which case the RP is more like a typical investment, the second party retains the full rights of ownership of the security

## **2. Federal Reserve's Book Entry System for Treasury Securities**

-the US Treasury Department in conjunction with its fiscal agent the Fed has been phasing in a paperless system to support trading in Treasury Securities; all T-bills are paper less securities and notes and bonds are moving that direction

-computer at the Federal Reserve maintains owner and agent; the agent must be qualified to maintain an account at the Fed, which restricts that role to depository institutions and the Treasury as well as a few government agencies and foreign governments; therefore, the agent acts on the owner's behalf

-if an individual buys 10,000 in a mutual fund, the mutual fund uses a bank with a Fed deposit, and the Fed transfers ownership of the new security to the bank, debits its account by 10,000 and credits the Treasury's account with the Fed by 10,000 (again, no money is transferred at the base level, the bank just has higher excess reserves available for lending)

-mutual fund custodial business is highly concentrated within the banking industry; State Street Bank Boston holds the largest share; there is a time delay if the purchase is made at a Treasury auction; in that case, the mutual fund must first submit a tender to the Treasury for the security; a few days later it receives the bill on the so-called settlement date

-when primary government securities dealers want to purchase Treasury securities, the process is similar; the dealers are purchasing securities to add to their accounts, and still must use member banks; government securities dealers are also financial intermediaries, so they are not the source of the funds they are investing

-this business is also highly concentrated, with Chase and Chemical Banks being the 2 largest clearing banks

## **3. Dealer Financing in the RP Market and DVP Transfers on the Securities Wire**

?where do they dealers get the cash for securities purchases?

-the majority of the fraction of the inventory of the government securities that government securities dealers hold is financed in the repo market; thus, each day maturing repos are replaced with new RPs and a daily pattern of trading over the Fed's book entry system is created

-an important characteristic of this type of trading is that the timing of the individual transactions is governed by their “delivery-versus-payment” system DVP

### ***Process***

1. mutual and fund want to trade an RP; they both notify their agents
2. the government securities dealer controls the timing of the initial transaction; he must personally notify the Fed to move the securities to the RP lender’s bank
3. mutual fund’s commercial bank sends notice to the Fed to transfer funds from its account to that of the dealer’s commercial account upon receipt of the securities
4. Fed effects the transaction once dealer gives OK to send securities, and mutual fund sends funds; claims on the securities are transferred to the mutual fund’s bank, and at the same time the bank’s deposit balance is debited and the dealer’s bank account is credited (liability to the Fed)

-a large volume of these transactions takes place each morning after the Fed’s securities wire open at 8:30 AM—the dealers are securing financing for the day for their inventories of government securities; the transaction is then unwound the next day with interest considerations, and that transaction is also on a DVP basis, but the timing is now controlled by the mutual fund’s bank, which is sending back the securities or returning the collateral

-the bank has incentive to return the collateral as quickly as possible, because it will be receiving its good funds to reinvest more quickly; thus, the morning rush is accompanied by the unwinding of repos in which dealer’s banks are debited at the Fed usually creating overdrafts that must be eliminated by the time the securities wire closes for the day (banks are not allowed to have overnight overdrafts on their Fed accounts)

-the official time for closing is 2:30 PM, but is usually extended to 4:00 PM; there is an intraday overdraft fee that comes in at 11:30 AM; as a consequence, the market is somewhat thinner when the Federal Reserve enters, but has remained sufficiently liquid to support open market operations

## **4. RPs with the Federal Reserve and Their Connection with the Federal Funds Market**

-in addition to the securities wire, the Fed operates an electronic system for federal funds transactions known as the Fedwire funds transfer service; Fedwire opens earlier in the day and closes later in the day than the securities wire; moving towards open more as global interconnectedness increases

-the funds wire is used by commercial banks as a vehicle for electronic payments

### ***2 Uses of Fedwire***

1. check clearing

-increases and decreases bank reserves, so total reserves are unaffected, as bank deposits at the federal reserve constitute a major proportion of total bank reserves

2. transfer of federal funds from a bank that has excess reserves to lend to a bank that is reserve deficient

-trading in the federal funds market is unaffected by activities of the Federal Reserve in the repo market

-the Fed is saying to be doing an RP, not a reverse RP, when they acquire securities

-legally, the Fed is prohibited from borrowing from the private sector, but it can buy and sell securities from its portfolio; therefore, if it wants to enter into an reverse RP

transaction where it gives up securities (normal repo), it consummates 2 permanent transactions—it sells a security from its portfolio and repurchases the same security for delivery at a future date

-these transactions are called matched sale-purchases MSPs, and are another way of negotiating a (reverse) repurchase agreement in which the Fed is temporarily reducing its portfolio holdings of government securities (increases money supply)

***Technical Differences Between MSP and reverse RP***

1. pricing mechanism is modified for the MSP because it requires 2 separate transactions and hence 2 separate prices
2. reverse RP requires only 1 price or interest rate
3. many of the Fed's term repos have withdrawal provisions that permit the counterparty to terminate the agreement early in the event of interest rate movements
4. no early termination provisions for MSPs because these transactions are outright purchases and sales of securities

-no net change in bank reserves from RP transactions between private parties; the Fed just transfers balances between reserve accounts; when the repurchase agreement involves the Fed on 1 side of the transaction, there is a change in reserves

-when the Fed does an RP with the market, when it enters into a repurchase agreement in which it temporarily acquires securities, it makes payment by creating base money in the form of bank reserves; those reserves are then traded in the federal funds market

-if the Fed does an RP (acquires securities), the dealer bank sends the securities to the Fed, and the Fed simply credits the bank's reserve account; no funds are transferred from other bank accounts, and thus total bank reserves increase, and the federal funds rate declines

-thus, when the Fed participates in the RP market (for government securities), the federal funds market is directly affected; unlike the relatively small effect that the Fed has on the RP market, where there is a lot of daily activity, its effect on the federal funds market is very pronounced

-reverse RPs or MSPs are when the Fed sells securities to decrease the money supply, reserves are drained and the fed funds rate rises; RPs are when the Fed buys securities increasing the money supply and adding reserves and the fed funds rate falls

-RPs are when the person trade securities for cash; reverse RP is when the person trades cash for the security

**5. Arbitrage of the RP Rate and the Federal Funds Rate**

-the relationship between the federal funds rate and the RP rate is very close, primarily because commercial banks are in the position to arbitrage any spreads between them

-federal funds sold are generally viewed as unsecured loans, but not risky due to short-maturity and low default risk; reverse RPs are even less risky, because they are collateralised by the securities; therefore, the RP rate is sometimes a few basis points below the federal funds rate

-if the federal funds are above the RP rate, banks in the position to do so will RP more of their government securities and lend the funds in the federal funds market

- however, there may be unusual conditions in the RP market, when dealers are having trouble placing their securities; one service offered by banks is to be the residual lender to dealers, who must finance their inventories by day end
- in this event, the commercial banks must fund, often in the federal funds market; this service also has the result of reducing the spread between the 2 rates, as banks pass along the higher costs to the dealers, effectively raising the RP rate
- the opposite arbitrage condition is present when the RP rate is above the federal funds rate; commercial banks can borrow in the federal funds market and do reverse RPs with dealers—this activity would increase demand for federal funds, causing that rate to rise, while increasing the demand for RPs, causing the RP rate to fall

## **6. The Mix of Outright Purchases, RPs, and MSPs**

- over time the liquidity needs of a growing economy expand—to meet those needs while maintaining a stable average money price of goods over the business cycle, the Fed must expand its bank reserves
- if reserves expand too slowly, prices will fall; if they expand too rapidly, the economy will undergo systematic inflation
- to provide for the long-run average rate of growth of bank reserves, the Fed must expand its asset base—to do so it relies almost exclusively on purchases of government securities (System Portfolio)
- the Fed also acts as an agent for foreign governments buying US securities-it deals securities for them through their Fed Reserve accounts
- \***customer RPs**- repurchase agreements acquired on behalf of foreign governments; have little effect on implementation of monetary policy through open market operations, because their effect on the reserves market can always be offset by trading from the System Portfolio—however, they are sometimes used to signal the Fed’s view of current conditions in the federal funds market

### ***3 Ways to Expand System Portfolio***

#### **1. Outright Purchases- outright**

- permanent additions to the portfolio; can still be sold, but are not temporary in nature like RPs and MSPs
- relatively infrequent, 4 to 8 per year—consequently, RPs and MSPs are needed to bring the System Portfolio into balance

#### **2. RPs**

#### **3. MSPs**

- there is a step-like progression, as outright purchases are made and then the temporary transactions even out the smaller inconsistencies
- temporary’s are usually preferred to a series of outright, which are technically more difficult to arrange—therefore, the bulk of open market operations conducted by the desk at the Federal Reserve Bank New York are temporary operations in the RP market involving either RPs when there is a temporary need to add reserves or MSPs when there is a temporary need to drain reserves from the banking system

- as the economy expands, its liquidity needs grow—if the banking system is to provide the additional liquidity, there must be secular growth in bank reserves which requires an

expansion of the Fed's balance sheet; the Fed expands its balance sheet by increasing its holdings of US treasury securities through outright purchases in accordance with policy directives from the FOMC; to maintain flexibility and handle day-to-day issues, temporary RPs and MSPs are used

-commercial banks play an important role in the RP market, not only as intermediaries in the transactions, but also as issuers of RPs and as residual sources of dealer financing; their ability to arbitrage rates between the RP market and federal funds market that ensures open market operations

# Time Inconsistency and the Credibility of Monetary Policy

## 1. Time Inconsistency in Monetary Policy

- government policies are part of the economic landscape; when their policies change or they adopt a new one, the prior decisions of households and firms with regard to resource allocation may not be optimal—therefore, resource allocation decisions must be forward looking as households and firms must attempt to evaluate the credibility of any new government policy before committing resources to any new course of action—will the government stick to the policy, will it be modified, what will the next policy look like
- to answer these questions, households and firms must evaluate the incentives that government policy makers face when they select 1 policy option over another—resoluteness of keeping the course, or will they change policy course if economic conditions dictate so
- the process of private-sector decision making may make the selection of any so-called optimal policy problematic if the government retains the ability to alter policy in the future
- for example, if the monopoly patent system is successful in finding disease cures, then would the government revoke the patent after the cure is found so the treatment can be disseminated to the public as quickly as socially desirable for the lowest competitive cost
- \*time inconsistency of optimal policy design-** can alter the response of the private sector to the policy; when the success of the original policy in altering resource allocations in the economy is itself responsible for altering the economic environment in such a fundamental way that continuation of the policy is no longer optimal and even appears socially irresponsible
- affects the design of all discretionary public policies, including monetary policy, that are intended to achieve a specific policy objective, and it provides a basis for favouring the conduct of policy according to visible rules
- when the government cannot possibly commit to such a policy because it would be socially irresponsible in the long-run, but good in the short run for financial purposes; if the government cannot credibly commit to a policy, the firm will not commit its resources to the desired course of action that the policy is intended to elicit
- time-consistency plays out when short-run objectives of full-employment and price stability are pursued—the inability of the central bank to commit to a specific policy when it maintains discretion to respond to macroeconomic shocks may preclude any short-run policy decisions from having desirable effects on the economy—this conclusion holds even when the policy makers and the public agree on the objectives of the policy
- additionally, in the presence of other economic distortions such as capital income taxes that reduce the full employment levels of employment and output, the pursuit of the short-run policy objectives of full employment and price stability may introduce an inflationary bias into monetary policy that otherwise wouldn't be present
- the incentives of policy makers can be exploited to reduce the inflation bias—1 option is the use of performance-based incentives in a contract to which each central banker must

agree, where performance is measured by comparing the actual inflation rate with a publicly announced inflation target—such a contract may allow some constructive use of stabilisation policy without the attendant inflationary bias

- in actual economies, policy makers may attempt to choose an optimal policy according to criteria that coincide with maximising social welfare—these criteria are full employment and stable prices

- still, households and firms must continue to make their own microeconomic decisions involving the future commitment of resources; in making those decisions, as the future economic environment is uncertain, households and firms must form expectations of what the economic environment will bring (including likely course of monetary policy)—

- however, the selection of an optimal monetary policy depends on those expectations
- these commitments by firms and households include binding nominal wage contracts and labour/leisure decisions

- an optimal policy is time inconsistent, because a policy that is optimal today affects private-sector decisions, such as the nominal wage in the second period, that in turn render the policy suboptimal in the future

- a consistent policy is suboptimal, one that pursues a short-run objective such as the stabilisation policy of full-employment and stable prices, is suboptimal, because each period it necessarily alters the economic environment on which past private-sector commitments were based

## **2. Rules v. Discretion**

- when the monetary authority pursues consistent policies whereby it seeks to achieve full-employment and stable prices simultaneously, no pronouncement that it can make today about future policy can be fully credible—thus, the private sector realises that the monetary authority will not continue a policy that is inconsistent with its short-run stabilisation objectives and that such a policy will be abandoned; the exercise of discretion can lead to a long-term inflationary bias in the policy that could be eliminated if the monetary authority conducted policy according to a hard-and-fast rule that preserves price stability over a longer time horizon

- a mechanism is clearly needed that would force policy makers to commit to a specific policy that would achieve a more desirable long-run outcome—in particular, a policy that would eliminate the inflation bias without having a less desirable outcome for employment

- one such policy would be to require the monetary authority to abandon its short-run goals and conduct policy according to a hard-and-fast, publicly announced rule

- one such rule is a monetary rule whereby the rate of monetary growth is consistent with an average inflation rate of 0—in this case, optimal labour contracts could be written that are premised correctly on an average inflation rate of 0

- by definition, a policy conducted according to a rule eliminates policy makers' discretion in decisions—the switch in policy regimes may have an important consequence: unless a rule could be written that contains contingencies for all possible future events, short-run stabilisation policy must essentially be abandoned

### 3. Reputation-Building and Discretionary Policy

-many economists argue that conducting policy according to a hard rule such as CGR or gold standard may not be desirable or politically feasible—thus could institutional arrangements or other mechanisms could be structured to cope with the time inconsistency problem

-even if the monetary authority has private information, it must be able to accurately transform that information into accurate forecasts for policy by discretion to be favoured to policy by the rule

?is it possible to allow policy makers some discretion in their pursuit of short-run policy objectives while eliminating the inflation bias?

-one inherent method of punishment is to limit the degree of credibility that the private information gives to the policies chosen—that is, the private sector would respond to policy pronouncements as warranted by past policy decisions; if inflation were to begin to rise, the private sector may believe that the monetary authority is leaning more toward its inflationary policies and not using its private information to the public's benefit; in this case, the reputation of the policy maker would be damaged and subsequent policy pronouncements would lose credibility with the public

-when policy is credible, the economy remains at full employment and prices remain stable; when the monetary authority fails to achieve a reputation as an inflation fighter, the economy dips below full employment as prices fall

-the potential loss of reputation is 1 incentive for the monetary authority to limit the inflation bias in its policy decisions; once it loses its reputation as an inflation fighter, the loss of credibility weakens the effectiveness of monetary policy—in turn, the loss of effectiveness makes it even more difficult for the monetary authority to regain its former reputation and credibility

### 4. Is There an Optimal Contract for the Policy Maker?

-the incentive of maintaining the credibility associated with a strong reputation as an inflation fighter may not be enough to reduce the inflation bias significantly

-labour market heterogeneity may reduce the social benefits of the appointment of a conservative central banker, if the increased output variability associated with lower inflation disproportionately affects the sector of the economy operating under a nominal wage contract v. a sector in which nominal wages are perfectly flexible

#### *Punishment Options*

-institutional arrangements that increase punishment for policymakers for excessively inflationary policy

1. appointment of conservative central bankers with stronger inflation aversion than society at large

-difficult to measure and implement and ensure conservativeness after appointment

2. contracts for the central bankers

-tie central bankers' salary to the actual inflation rate in relation to a publicly announced inflation target—the closer the inflation rate was to the target, the higher the would be the central banker's salary

-the New Zealand legislation that was adopted was the central banker was required to sign a contract with the government to maintain the inflation rate within a specified target range; if the inflation target was not met, the central banker could be dismissed



- the contract can contain terms that are readily enforceable and easily observed—therefore compliance to the contract by the central banker and enforcement of the contract by the government could be monitored by the private sector
  - under this contract conditions, if the penalty for noncompliance were sufficiently stringent and its enforcement provisions were credible, the private sector could make commitments that affect future allocations of resources on the presumption that the inflation bias would be reduced, or at least that the actual inflation rate would not substantially exceed the inflation target
  - this contract eliminates some of the disadvantage of a purely discretionary regime by reducing the inflation bias, and retains some of the potential advantage of allowing the central bankers to operate with enough discretion to pursue short-run stabilisation objectives
  - an optimal contract is one that simultaneously achieves its stabilisation objectives, optimally weighing the short-run volatility in output and employment against price instability, while eliminating its long-run inflation bias
  - in principle, punishment of the central bankers that is based solely on the inflation target could produce an optimal contract; however, it requires precise knowledge of each central banker's inflation bias and the value of the personal disutility of the punishment that the enforcement provisions carry—although, neither is likely to be known with sufficient accuracy to make the optimal contract realistic
  - still, contracts with performance-based incentives have the potential to reduce the problems of inflation bias and suboptimality associated with the time inconsistency and credibility problems inherent in monetary policy design
- households and firms must be forward-looking in their resource allocation decisions; the government political decisions affect the economy, and when monetary policy change the households and firms must change their past resource allocation decisions; a policy-maker seeking short-term policy objectives in an uncertain world face a dilemma
- when the monetary authority fails to take fully into account the adverse affects of other government distortions, such as taxes on capital income, that could lower the actual full-employment levels of output and employment, or if it complies with political pressure to achieve on average a higher level of employment than is economically feasible, its policy will have an inflation bias
  - the private sector recognises the inflation bias and incorporates it into its future plans; in this case, the best the monetary authority can do is to fulfil the private sector's expectations, otherwise, it will introduce policy shocks to the economy that induce undesired fluctuations in output and employment
  - to eliminate inflation bias, monetary policy could be conducted according to a hard-and-fast publicly announced rule, such as monetary growth rate rule or the gold standard; because a rule could be written that covers all future contingencies, discretion would be necessary if short-run policy objectives are to be pursued—if the monetary authority has private information about the shocks the economy is undergoing, the potential gains that a discretionary policy could bring to the economy cannot be realised under a policy regime that essentially eliminates all discretion

- in the absence of a monetary policy governed entirely according to a rule, some reduction in inflation bias could come from loss of reputation central bankers face as inflation fighters due to high inflation policies
- the loss of reputation reduces the credibility which reduces the effectiveness of the monetary policy—in light of this fact, policy makers must avoid high inflation policies over extended periods of time to maintain credibility
- the reduction in inflation bias can be achieved through appointment of conservative central bankers whose personal preferences represent a greater aversion to inflation than the public's
- further inducement to reduce the inflation bias of discretionary monetary policies could be achieved through performance-based incentive clauses for the central bankers
- performance based incentives would constitute an optimal contract if they enabled the monetary authority to exploit its private information on the economy by pursuing short-term stabilisation objectives from which society may benefit without simultaneously incurring the inflation bias that is normally created by its lack of credibility
- it is not likely that such an optimal contract could be designed, as it would require knowledge of each central banker's inflation bias and personal preferences in relation to the incentives built into the contract
- however, central banker contracts could still be an intermediate solution to the policy dilemma created by the time inconsistency problem, allowing some policy discretion without causing a private-sector expectation of a substantial inflation bias that the monetary authority would be required to fulfil

# International Economics

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# I. International Trade Theory

## Introduction

### Good Books

1. David Hume- Of the Balance of Trade
2. Adam Smith- Of Moral Sentiments
3. Adam Smith- The Wealth of Nations
4. David Ricardo

### 1. What is International Economics

-involves similar concepts, but must consider trade restrictions and sovereignty laws

#### *7 Primary Themes*

1. Gains from Trade
2. Pattern of Trade
3. Protectionism
4. Balance of Payments
5. Exchange Rate Determination
6. International Policy Coordination
7. International Capital Market

### 2. International Economics: Trade and Money

-no simple dividing line, both involve each other

#### *2 Broad SubFields*

##### **1. International Trade**

- real transactions; physical flow of goods
- tariffs and such

##### **2. International Money**

- monetary movements and payments
- fixed v. floating exchange rates

## World Trade: An Overview

### 1. Who Trade With Whom

-gravity model suggests that, like Newton's Law of Gravity, trade between 2 countries is proportional to the size of their GDPs

\***gravity model**- relates the trade between any 2 countries to the sizes of their economy; use of the gravity model reveals the string effects of distance and international borders- even friendly borders like the US and Canada- in discouraging trade

### 3 Trade Determinants

1. GDP country A
2. GDP country B
3. distance

-cultural and geographic differences can explain anomalies in the gravity model

### 3 Impediments to Trade

1. distance
2. barriers
3. borders

-even exists within a country between states or provinces

### 2. Changing Pattern of World Trade

-international trade is at record levels relative to the size of the world economy, thanks to falling costs of transportation and communications

-trade has not grown in a straight line; the world was highly integrated in 1914, but suffered after and took decades to recover

-manufactured goods dominate modern trade today; in the past primary products were much more important than they are now; recently, trade in services has become more important

-developing countries, in particular, have shifted from being mainly exporters of primary products to mainly exporters of manufactured goods

-third world and developing countries are lots of times former European colonies

-service outsourcing is one of the hottest areas of international trade currently

### 3. Old and New Rules

-same economic concepts still hold true, just the participants and products have changed

# Labour Productivity and Comparative Advantage: The Ricardian Model

## 1. Comparative Advantage

- \***Ricardian model**- international trade is due solely to international differences in the productivity of labour in the different industries; simplest model
- in this model, countries will export goods that their labour produces relatively efficiently and import goods their labour produces relatively inefficiently; country's production pattern is determined by comparative advantage
- \***opportunity cost**- trade-off between producing 1 good over another
- \***comparative advantage**- when the opportunity cost of producing a good in terms of other goods is lower in that country than in other countries

## 2. A 1-Factor Economy

- any economy will have unit labour requirements, production possibilities, and relative prices and supply
- \***unit labour requirement**- the number of hours of labour required to produce a pound of cheese or a gallon of wine
- \***production possibility frontier**- graph showing the maximum amount of wine that can be produced once the decision has been made to produce any given amount of cheese, and vice versa
- when only 1 factor of production, it is a straight line; shows what the economy can produce
- to determine what the economy will produce, we must know relative prices and supply of the goods
- in the absence of international trade, the relative prices of goods are equal to their relative unit labour requirements

## 3. Trade in a 1-Factor World

- comparative advantage of 1 good requires analysis of all 4 unit labour requirements, not just the 2
- \***absolute advantage**- when 1 country can produce a unit of a good with less labour than another country
- but we cannot determine patterns of trade from absolute advantage; we need comparative advantage

### 2 Options for Determining Relative Price After Trade

1. partial equilibrium analysis- study a single market
  2. general equilibrium analysis- study multiple markets together
- must focus on the relative demand and supply (as compared with other countries) to fully understand international trade
  - \***gains from trade**- mutual gains from specializing in products

### 2 Benefits from Trade

1. trade is an indirect method of production; can trade for goods less cheaply
  2. trade enlarges a country's economy giving them access to new goods
- \*relative wages-** wages as compared to those in other countries
- the distribution of the gains from trade depend on the relative prices of the goods countries produce; to determine relative prices must examine relative world supply and demand for goods; relative price implies a relative wage rate as well

#### **4. Misconceptions About Comparative Advantage**

- the proposition that trade is beneficial is unqualified; there is no requirement that a country be competitive or that trade be fair

#### **3 Disbeliefs**

- myth and truth

**1. Productivity and Competitiveness-** a country gains from trade even if it has lower productivity than its trading partner in all industries

**2. Pauper Labour Argument-** trade is beneficial even if foreign industries are competitive only because of low wages

**3. Exploitation-** trade is beneficial even if a country's exports embody more labour than its imports

#### **5. Comparative Advantage with Many Goods**

- extending the 1-factor 2-good model to a world of many commodities does not alter anything; the only difference is that it is necessary to focus directly on the relative demand for labour to determine relative wages rather than to work via relative demand for goods

- also, a many-commodity model can be used to illustrate the important point that transportation costs can give rise to a situation in which some nontraded goods exist

**\*derived demand-** demand is not direct in the multi-good model; it results from the demand for goods produced with each country's labour

#### **6. Adding Transport Costs and Nontraded Goods**

- adding in transportation costs results in nontraded goods (caviar, haircuts)
- we spend a lot of our income on the nontraded goods

#### **7. Empirical Evidence on the Ricardian Model**

- supports the premise that trade depends more on comparative and not absolute advantage; relative productivity and wages is important too

#### **4 Limitations of Ricardian Model**

1. predicts an extreme degree of specialization we don't really see
2. downplays the effect on international trade on income distribution
3. does not integrate resources into the trade model
4. neglects economies of scale

- while some predictions of the Ricardian model are clearly unrealistic, its basic prediction- that countries will tend to export goods in which they have relatively high productivity- has been confirmed

## Resources, Comparative Advantage, and Income Distribution

-introduces a model which emphasizes resources as the only determinant, not comparative advantage; abundance of factors and intensity of use

-also known as the factor-proportions theory (Heckscher-Ohlin Theory)

### 1. Model of a 2-Factor Economy

-production possibility frontier is no longer linear; it is curved to reflect differences in both constraints

-to understand the role of resources in trade, a model with 2 goods and 2 factors of production is needed; the 2 goods differ in their factor intensity

**\*factor intensity-** at any given wage-rental ratio, production of 1 of the goods will use a higher ratio of land to labour than production of the other

-factor prices must be considered, as some goods are labour intensive and some are land intensive

-as long as a country produces both goods, there is a 1-to-1 relationship between the relative prices of goods and relative prices of factors used to produce the goods

-a rise in the relative price of the labour-intensive good will shift the distribution of income in favour of labour, and will do so strongly; the real wage of labour will rise in terms of both goods, while the real income of landowners will fall in terms of both goods

-factor prices directly affect goods prices; resources directly affect output

-an increase in the supply of 1 factor of production expands production possibilities, but in a strongly biased way; at unchanged relative goods prices, the output of the good intensive in that factor rises while the output of the other good actually falls

**\*biased expansion of production possibilities-** occurs when the production possibility frontier shifts out much more in 1 direction than in the other; explains international trade; an increase in 1 resource leads to much more production of that good

### 2. Effects of International Trade Between 2-Factor Economies

-a country that has a large supply of 1 resource relative to its supply of other resources is abundant in that resource; a country will tend to produce relatively more of goods that use its abundant resources intensively

**\*Heckscher-Ohlin theory of trade-** countries tend to export goods that are intensive in the factors with which they are abundantly supplied

**\*budget constraint-** equation showing the amount an economy can afford to import based on their exports

-because changes in relative prices of goods have very strong effects on the relative earnings of resources, and because trade changes relative prices, international trade has strong income distribution effects; the owner's of a country's abundant resources gain from trade, but the owner's of scarce factors lose

-in an idealized model international trade would actually lead to equalization of the prices of factors such as labour and capital between countries; in reality, complete factor-price



equalization is not realized because of wide differences in resources, barriers to trade, and international differences in technology

**\*equalization of factor prices-** theory stating that the relative prices of goods converge with international trade

-trade producers winners and losers; but, the winners could compensate the losers and everyone would be better off

**\*specific factors-** fixed short variables

-short run gains and losses affect political decisions

-most economists do not regard the effects of international trade on income distribution as a good reason to limit this trade; it is no different from other economic forms of change in this regard; better to address the problem of income distribution directly, rather than by interfering with trade flows

### **3. Political Economy of Trade- A Preliminary View**

-the actual politics of trade policy income distribution is crucial; those who lose from trade are usually a more informed, cohesive, and organized group than the winners

-gains from trade increase everyone's consumption options and standard of living

### **3 Arguments Against Income Distribution of Trade**

1. income distribution effects are not specific to international trade

2. it is better to allow trade and compensate those who are hurt

3. those who stand to lose are better organized than winners

-quotas and tariffs will be implemented for political reasons

### **4. Empirical Evidence on the Heckscher-Ohlin Model**

-empirical evidence is mixed, but most agree that resources alone cannot explain world trade patterns or factor prices; technology differences must be considered as well

**\*Leontief paradox-** exports are less capital intensive than imports, or vice versa; contradicts the factor-proportions theory

**\*isocost line-** combination of land and labour inputs that cost the same amount

## The Standard Trade Model

### 1. Standard Model of a Trading Economy

-standard trade model derives a world relative supply curve from production possibilities and a world relative demand curve from preferences; the price of exports relative to imports, a country's terms of trade, is determined by the intersection of the world relative supply and demand curves

-builds on the Ricardian and Heckscher-Ohlin

-other things equal, a rise in a country's terms of trade increases its welfare; conversely, a decline in a country's terms of trade will leave the country worse off

### 4 Relationships of Standard Trade Model

1. relationship between production possibility frontier and relative supply curve

2. relationship between relative prices and relative demand

3. determination of world equilibrium by world relative supply and world relative demand

4. effect of terms of trade

**\*isovalue line**- indicates market value of output; lines along which the value of output is constant

### 3 Properties of Indifference Curves

-represents the tastes of individuals

1. downward sloping

2. up and to the right is better

3. get flatter as we move to the right

-economic growth means an outward shift in a country's production possibility frontier; such growth is usually biased in that the frontier shifts more for some goods than for others; the immediate effect of biased growth is to lead to an increase in the world relative supply of the biased good

-this shift in the world relative supply curve affects the country's terms of trade; if the country's terms of trade improves, the rest of the world hurts and vice versa

-the direction of the terms of trade effect depends on the nature of the growth; growth that is export-biased (same goods they are exporting), hurts the terms of trade; growth that is import-biased improves the terms of trade, because fewer goods need to be imported

-it is possible for import-biased growth abroad to hurt a country

**\*export-biased growth**- growth that disproportionately expands a country's production possibilities in the direction of the good it exports

**\*import-biased growth**- growth biased toward the good the country imports

-growth of newly industrialising nations can hurt advanced nations, or vice versa;

advanced countries tend to push import-biased and developing push export-biased growth

**\*immiserizing growth**- hurting welfare by producing too much export-biased growth

### 2 Reasons Growth is Biased

1. technology

2. resources

## 2. International Transfers of Income: Shifting the RD Curve

-international transfers of income, such as war reparations and foreign aid, can affect a country's terms of trade by shifting the world relative demand curve; if the country receiving the transfer spends more from income increases on producing the export goods than its giver, then a transfer raises world relative demand for the recipient's export good and thus improves its terms of trade; this improvement reinforces the original transfer and provides an indirect benefit in addition to the direct income transfer

-however, if the recipient has a lower propensity to spend on its export at the margin than the donor, then a transfer worsens the recipient's terms of trade, offsetting part of the transfer's effect

**\*marginal propensity to spend**- more willingness to spend on a particular good

-in practice, most countries spend a much higher share of their income on domestically produced goods than foreigners do; this is due not to taste but to natural and artificial barriers to trade resulting in nontraded goods

-if nontraded goods compete with exports for resources, transfers will usually raise the recipient's terms of trade

## 3. Tariffs and Export Subsidies: Simultaneous Shifts in RS and RD

-import tariffs and export subsidies affect both relative supply and demand

-a tariff raises relative supply of a country's import good while lowering relative demand; a tariff unambiguously improves the country's terms of trade at the rest of the world's expense

-an export subsidy has the reverse effect, increasing the relative supply and reducing the relative demand for the country's export good, and thus worsening the terms of trade

**\*external prices**- prices for foreigners

**\*internal prices**- prices at home

-the terms of trade effects of an export subsidy hurt the subsidizing country and benefit the rest of the world, while those of a tariff do the reverse; this suggests that export subsidies should be discouraged and foreign export subsidies should be welcomed

-however, both tariffs and subsidies weigh heavily on income distribution within a country, and thus policy often is more influential than terms of trade concerns

**\*Metzler paradox**- tariffs and export subsidies actually hurt the home country more; similar to immersization

**\*offer curve diagram**- depicts what each country ships to the other

## Economies of Scale, Imperfect Competition, and International Trade

### 1. Economies of Scale and International Trade

- trade need not to be from competitive advantage; it can result from increasing returns or economies of scale instead
- models of comparative advantage assume constant returns to scale; this one assumes increasing returns (economies of scale)
- economies of scale give countries an incentive to specialize and trade even in the absence of differences between countries in their resources or technologies
- economies of scale can be external (depending on the size of the industry) or internal (depending on the size of the firm)

### 2. Economies of Scale and Market Structure

- to analyze effect of economies of scale on market structure, one must be clear about what kind of production increase is necessary to reduce average cost
- \***external economies of scale**- occur when the cost per unit depends on the size of the industry but not necessarily on the size of any 1 firm
- \***internal economies of scale**- occur when the cost per unit depends on the size of an individual firm but not necessarily on that of the industry
- external economies of scale results in many small firms and is perfectly competitive
- internal economies of scale results in few large firms and imperfectly competitive
- both important but hard to quantify at the same time

### 3. Theory of Imperfect Competition

- internal economies of scale
- firms become price setters, not price takers
- economies of scale normally lead to a breakdown of perfect competition, so trade in the presence of economies of scale must be analyzed using models of imperfect competition
- \***pure monopoly**- where the firm faces no competition
- marginal revenue is always less than price; the firm must lower the price of all units not just the marginal one; for the monopolist the MR curve is always below the demand curve; how much lower depends on the current price and the slope of the demand curve
- fixed costs encourage economies of scale, because the larger the easier to deal with
- when AC are decreasing, MC is always less than AC
- profit maximizing point for a monopolist is where  $MR=MC$
- \***oligopoly**- several firms uncontested
- prices between firms are interdependent
- \***monopolistic competition**- 2 assumptions; differentiation of products and ignores prices of competitors

#### *3 Steps for number of firms and average cost*

1. the number of firms and average cost

2. the number of firms and the price
  3. the equilibrium number of firms
- in the long run, the number of firms is determined by the intersection of the curve that relates average cost to  $n$  and the curve that relates price to  $n$

### **Limitations of Monopolistically Competitive Model**

1. firms actually act with interdependence
2. collusive behaviour
3. strategic behaviour

### **3 Imperfect Monopolistic Competition Models**

1. trade model
2. dumping model
3. external economies – consistent with perfect competition

### **4. Monopolistic Competition and Trade**

- in monopolistic competition, an industry contains a number of firms producing differentiated products; these firms act as individual monopolists, but additional firms enter a profitable industry until monopoly profits are competed away
- equilibrium is affected by size of the market: a large market will support a larger number of firms, each producing at larger scale and thus less average cost, than a small market
- international trade allows creation of an integrated market that is larger than any 1 country's market, and thus makes it possible simultaneously to offer consumers a greater variety of products and lower prices
- increased market size allows for creation of bigger economies of scale
- economies of scale and comparative advantage creates situations where countries produce differentiated products and still trade with each other

### **2 Kinds of Trade in Monopolistic Competition**

1. intraindustry- within the same industry; reflects economies of scale
  2. interindustry- between industries; reflects comparative advantage
- intraindustry trade does not generate the same strong effects on income distribution as interindustry trade
- the patterns of intraindustry trade are unpredictable
- the relative importance of intraindustry trade and interindustry trade depends on how similar the countries are
- intraindustry trade is  $\frac{1}{4}$  of total trade; important because it creates additional trade through wholesale and retail relationships; much more common between countries of similar economic levels
- can create issues for trading between developing and developed countries

### **5. Dumping**

- most common form of price discrimination
- dumping occurs when a monopolistic firm charges a lower price on exports than it charges domestically
- profit-maximizing strategy when export-sales are more price-responsive than domestic sales; and when firms can effectively segment markets, that is, prevent domestic customers from buying goods intended for foreign markets

**\*reciprocal dumping**- occurs when 2 monopolistic firms dump into each other's home markets; cause of international trade  
 -reciprocal dumping can have positive benefits when products are slightly different

## **6. Theory of External Economies**

-results in perfect competition where firms are price takers  
 -external economies are economies of scale that occur at the level of the industry instead of the firm  
 -when external economies are important, a country starting with a large industry may retain that advantage even if another country could potentially produce the same goods more cheaply; countries can conceivably lose from trade also in this scenario

### **3 Reasons for External Economies**

1. specialized suppliers
2. labour market pooling
3. knowledge spillovers

-external economies can give rise to increasing returns at the level of the national industry

**\*forward-falling supply curve**- the larger the industry's output, the lower the price at which firms are willing to sell their output

## **7. External Economies and International Trade**

-can lead countries to get locked into a pattern of trade and lead to losses  
 -could get too dependent on that product, and another country comes in that can produce cheaper  
 -external economies leads to positive welfare for the world as a whole; however, individual countries can always be better off from altering the external economies to their preferences  
 -dynamic increasing returns results from learning curves; however, can lock in the country in the long run as well  
 -infant industry argument, or temporary protection of nascent industries, has some holding some places

## **8. Interregional Trade and Economic Geography**

-interregional trade will happen everywhere; will have centralized locations and more decentralized businesses throughout the regions  
 -economic geography is the compiling of the geography to economics

## International Factor Movements

-factor movements include: labour migration, capital transfers, and movements of multinational corporations

### 1. International Labour Mobility

-less prevalent than capital flow due to more restrictions

-international factor movements can sometimes substitute for trade; as is international migration of labour is similar in its causes and effects to international trade based on differences in resources

-labour moves from countries where it is abundant to countries where it is scarce; this movement raises total world output, but also generates string income distribution effects

### 3 Notes

1. leads to convergence of real wage rates
2. increases total world output
3. despite this gain, some people are hurt

### 2. International Borrowing and Lending

-international borrowing and lending is a kind of international trade, but one that involves trade of present consumption for future consumption rather than trade of 1 good for another

-the relative price at which international trade takes place is 1 plus the real rate of interest  
\***intertemporal trade**- trading today for tomorrow; intertemporal production possibility frontier

-even without financial transactions, firms still face decisions about PV/FV

-intertemporal competitive advantage means the country will have the advantage in the future because of decisions made today

### 3. Direct Foreign Investment and Multinational Firms

-multinational firms, while they often serve as vehicles for international borrowing and lending, primarily exist as ways of extending control over activities taking place in 2 or more countries

-not really flows of capital though, more like extensions of the company

-there must be control of the subsidiary to be a multinational

-the theory of multinational firms is not as well developed as other parts of international economics

### 2 Elements that Explain the Existence of a Multinational

#### 1. location motive

-leads the activities of the firm to be in different countries

-these motives are the same as those for all international trade

#### 2. internalization motive

-leads these activities to be integrated in a single firm

-these motives are less well understood; 2 possibilities: need for a way to transfer technology (can be troublesome) and the advantages in some cases of vertical integration

-multinational firms have little need in actuality; the first motive labour and capital movements (location), could be performed without the need of multinationals; so even though they are praised, they may not be all that good



## II. International Trade Policy

### The Instruments of Trade Policy

#### 1. Basic Tariff Analysis

-analysis of trade policy only needs a partial equilibrium approach, opposed to earlier analyses which required the general equilibrium approach

\***specific tariffs**- levied as a fixed charge for each unit of goods imported

\***ad valorem tariffs**- taxes levied as a fraction of the value of the imported goods

-both tariffs raise the cost of shipping goods to the country

-tariffs are the oldest form of trade policy and have traditionally been used as a source of revenue; used more in the past

\***nontariff barriers**- import quotas and export restraints; have become more common than tariffs

\***import quota**- limitations on the quantity of imports

\***export constraint**- limitations on the quantity of exports—usually imposed by the exporting country at the importing country's request

-to determine the world price and the quantity traded, the home import demand curve and the foreign export supply curve are needed

\***Home import demand curve**- excess of what Home consumers demand over what Home producers supply

\***Foreign export supply curve**- excess of what Foreign producers supply over what Foreign consumers demand

-from the point of view of the person shipping the goods, the tariff is just like a cost of transportation

-a tariff drives a wedge between foreign and domestic prices, raising the domestic price but by less than the tariff rate; an important and relevant special case is that of a small country that cannot have any substantial influence on foreign prices; in that small country the tariff is usually reflected in domestic prices

\***effective rate of protection**- a 25% tariff could lead to a 100% protection rate; tells us how much protection the tariff provides to the domestic producers

-not always the amount of the tariff, as small country assumptions don't always hold and tariffs have different effects on the different stages of the production of the good

-therefore, trade policies aimed at promoting economic development often lead to rates of effective protection much higher than the tariff rates themselves

## 2. Costs and Benefits of a Tariff

- consumers lose in the importing country and win in the exporting country; producers gain in the importing country and lose in the exporting country
- costs and benefits of a tariff or other trade policy may be measured using the concepts of consumer and producer surplus; using these concepts, we can show that the domestic producers of a good gain, because a tariff raises the price they receive; the domestic consumers lose for the same reason; there is also a gain in government revenue
- consumer and producer surplus is method for measuring costs and benefits from tariffs
- \*consumer surplus**- the amount a consumer gains from a purchase by the difference between the price he actually pays and the price he would have been willing to pay; can be derived from the market demand curve
- \*producer surplus**- the amount a producer gains from a purchase by the difference between the price he actually gets and the price he would have received; can be derived from the market supply curve
- most difficulties involved in CS and PS are related to technical issues of calculation; more importantly is the question of whether the direct gains to producers and consumers in a given market accurately measure the social gains

### *2 Parts of Net Tariff Welfare Effect*

#### 1. Efficiency Loss

- results from the distortion in the incentives facing domestic producers and consumers

#### 2. Terms of Trade Gain

- reflects the tendency of a tariff to drive down foreign export prices
- in the case of a small country that cannot affect foreign prices, the second effect is 0 and there is an unambiguous loss

### *2 Other Parts of Net Tariff Welfare Effect*

- \*production distortion loss**- results from the fact that the tariff leads domestic producers to produce too much of this good
- \*consumption distortion loss**- results from the fact that the tariff leads consumers to consume too little of a good

## 3. Other Instruments of Trade Policy

- the analysis of a tariff can be readily adapted to other trade policy measures, such as export subsidies, import quotas, and voluntary export restraints
- an export subsidy causes efficiency losses similar to a tariff but compounds these losses by causing a deterioration in the terms of trade
- import quotas and voluntary export restraints differ from tariffs in that the government gets no revenue; instead, what would have been government revenue accrues as rents to the recipients of import licenses in the case of a quota and to foreigners in the case of a voluntary export restraint

### *7 Other Types*

- 1. export subsidy**- payment to a firm or household that ships a good abroad; can be specific (fixed sum per unit) or ad valorem (proportion of the value exported) just as a tariff

- when the government offers these, shippers will export the good up until the point where the domestic price exceeds the foreign price by the amount of the subsidy; the effects of an export subsidy on prices are exactly the opposite of a tariff

**2. import quota**- direct restriction on the quantity of some good that may be imported; usually enforced by licensing ; import quotas always raise the domestic price of the imported good

**\*quota rents**- monies received by the holders of the import licenses; the government receives no money from tariffs; when the licenses are held by foreign governments, import quotas really make no sense

**3. voluntary export restraint VER, VRA**- quota on trade imposed from the exporting country's side rather than the importer's; like a quota, more costly than a tariff because the rents go to people other than the government

**4. local content requirements**- a regulation that some specified fraction of a final good be produced domestically; no government revenue or quota rents, additional costs passed on in final price

-US and Mexico can export to each other to bypass content requirements; produce in another country

**5. export credit subsidies**- like an export subsidy, but it takes the form of a subsidised loan to the buyer

**6. national procurement**- governments or large businesses have to buy domestically even when imports are cheaper

**7. red-tape barriers**- unofficially restricting imports; easy to twist health, safety, and customs issues; must go through customs at a certain office

#### **4. Monopoly Firms and Tariffs**

-when doing general equilibrium analysis with tariffs, it is useful to start with the small country case and then integrate in the large country case

-all markets are not perfectly competitive as well

-international trade limits monopoly power, and any policies that limit trade therefore may increase monopoly power

-firms have little ability to raise prices when there are many foreign companies offering their goods as well

-with tariffs, monopolistic firms know that if they raise their prices too much they will still be undercut by imports; with quotas, they have absolute protection, because no matter how high the price, imports cannot exceed the price level

-so if governments are concerned about monopoly power, they should favour tariffs over quotas; however, there has been a shift from tariff barriers to non-tariff barriers lately— thus there are considerations other than economic efficiency that motivate governments

## The Political Economy of Trade Policy

### 1. Case for Free Trade

-most countries do not have entirely free trade; maybe Hong Kong  
 -although few countries practice free trade, most economists continue to hold up free trade as a desirable policy; this advocacy rests on 3 lines of argument

#### 3 Arguments

1. formal case for the efficiency gains from free trade that is simply the cost-benefit analysis of trade policy read in reverse

**\*efficiency case for free trade-** the reverse of the cost-benefit analysis for a tariff; the move to free trade eliminates distortions and efficiency losses

2. many economists believe that free trade produces additional gains that go beyond this formal analysis

-especially in small and developing countries: economies of scale (proliferation of firms), more opportunities for learning and improvements

3. given the difficulty of translating complex economic analysis into real policies, even those who do not see free trade as the best imaginable policy see it as a useful rule of thumb

**\*political argument for free trade-** any attempt to pursue sophisticated deviations from free trade will be subverted by the political process; special interest groups will get in the way

**\*rent-seeking-** additional costs incurred by individuals and companies trying to get import licenses; argument for free trade

-gains from free trade are smaller for advanced countries and greater for developing countries

### 2. National Welfare Arguments Against Free Trade

-there is an intellectually respectable case for deviating from free trade

#### 2 Arguments

##### 1. terms of trade argument

-countries can improve their terms of trade through optimal tariffs and export taxes; clearly valid in principle but not important in practice; small countries can't influence their terms of trade, but large countries can—large countries run the risk of disrupting trade agreements and provoking retaliation

**\*optimum tariff-** the tariff rate that maximises national welfare; always positive but less than the prohibitive rate that eliminate all import; usually used to refer to the tariff justified by as terms of trade argument rather than to the best tariff given all the possible considerations

-small countries can't influence the world markets, and big countries must create monopoly power to extract money from other countries (oil), thus bringing retaliatory actions from other countries

-used more as a theoretical proposition by economists than by governments for justification of trade policy

## **2. domestic market failures argument**

-if some market, such as the labour market, fails to function properly, deviating from free trade can sometimes help reduce the consequences of this malfunctioning

-3 types: labour market failure, capital market defects, and technological spillovers

\***marginal social benefit**- when society prospers from increases in output, but the firms do not; difficult to measure and incorporate into the firm's budget; this can serve as justification for tariffs or other trade policies

\***theory of the second best**- states that if 1 market fails to work properly it is no longer optimal for the government to abstain from intervention in other markets; government intervention may appear to distort incentives, but is actually helping

-domestic market failures is an example of the theory of second best

-a tariff may raise welfare if there is a marginal social benefit to production of a good that is not captured by producer surplus measures

-when economists apply this theory of second best, they argue that imperfections in the internal functioning of an economy may justify interfering in its external economic relations; international trade is not the source of the problem but can be a partial solution

-although market failures are probably common, the domestic market failure argument should not be applied too freely

### ***2 Defences for Free Trade in Light of Market Failures***

1. domestic market failures should be corrected by domestic policies aimed directly at the problems' source—tariffs are always a second best (inferior) way to offset domestic market failure, which is always treated at its source

2. market failure is difficult to analyse well enough to be sure of the appropriate policy recommendation

-all domestic failures should be confronted as directly as possible; don't use a second best policy when you can use a first-best 1; always consider the purely domestic policy first— if it is too expensive or not feasible, go with the trade policy

-most deviations from free trade result not because their benefits exceed their costs, but because the public fails to understand their true costs; quotas on Japanese cars instead of hiring subsidies for union auto workers for example

-economic theory does not provide a dogmatic defence of free trade, although it is accused of doing so; first-best solutions are not always practical

## **3. Income Distribution and Trade Policy**

-in practice, trade policy is dominated by considerations of income distribution; no single way of modelling the politics of trade policy exists, but several useful ideas have been proposed; national welfare ends up not being relevant in trade policy

### **1. median voter**

-political scientists have often argued that policies are determined by competition among political parties that try to attract as many votes as possible; this leads to adoption of policies that attract the median voter; while useful for thinking about many issues, this approach seems to yield unrealistic predictions for trade policies, which typically favour the interests of small, concentrated groups over the general public

### **2. collective action**

- because individuals may have little incentive to act politically on behalf of groups to which they belong, those groups that are well organised—typically small groups with a lot at stake—are often able to get policies that serve their interests at the expense of the majority
- political activity on behalf of a group is a public good, the benefits of such activity accrue to all members of the group, not just the individual who performs the activity; large losses to the group but small losses to any individual can be passed quietly
- range of protection is much broader for developing countries than for advanced countries
- agriculture and clothing are the only 2 industries that receive protection in advanced countries: they are labour-intensive and the technology is relatively simple

#### **4. International Negotiations and Trade Policy**

- it is difficult to devise trade policies that raise national welfare and trade policies are often dominated by interest group politics
- if trade policy were made on a purely domestic basis, progress toward freer trade would be very difficult to achieve; in fact, however, industrial countries have achieved substantial reductions in tariffs through a process of international negotiation
- \*international negotiation**- helps the cause of tariff reduction in 2 ways: helps broaden the constituency for freer trade by giving exporters a direct stake; and it helps governments avoid the mutually disadvantageous trade wars that internationally uncoordinated policies could bring
- most advanced countries have removed tariffs gradually since 1930s

#### ***2 Reasons it is Easier to Lower Tariffs via Mutual Agreement than Unilateral Policy***

1. mutual agreement helps mobilise support for free trade
  2. negotiated agreements on trade can help governments avoid getting caught in destructive trade wars
- prisoner's dilemma illustrates this example—both countries will do what is best for them, and neither will win
  - although some progress has been made in the 1930s toward trade liberalisation via bilateral agreements, since WWII international coordination has taken place primarily via multilateral agreements under the auspices of the GATT
  - multilateral agreements result in better trade standards for everyone than bilateral agreements

**\*General Agreement on Tariffs and Trade GATT**- comprises both a bureaucracy and a set of rules of conduct, is the central institution of the international trading system; the most recent worldwide GATT agreement also set up a new organisation, the WTO, to monitor and enforce the agreement; multilateral agreements

**\*World Trade Organisation WTO**- the formal organisation of the GATT agreements

#### ***Provisions of GATT and WTO***

1. **binding**- tariffs cannot increase; very effective
  2. nontariffs are not allowed; 1 exception is agricultural exports, which has been exploited
  3. import quotas have been grandfathered in
  4. **trade rounds**- lever for forward progress; countries get together and have a meeting
- named by country: Uruguay Round, Kennedy Round, Tokyo Round

-WTO is ratchets (prevent backsliding) and levers (push forward policies) such as the binders and liberalisation policies

### ***2 Benefits of Uruguay Round (8<sup>th</sup>)***

1. Trade Liberalisation- lowered tariffs, increasing world trade; especially in agriculture and textiles

2. Administrative Reforms- opened up wide range of government contracts for imported products

-WTO created at Uruguay Round; same basic things, but focuses on intellectual products and services now more; more formal legal process; no powers, but can allow the country to retaliate

-have been benefits from the Uruguay Round, but the benefits accrue to large groups while the costs have been extracted from smaller groups

-most importantly perhaps it has stabilised world trade to some degree and prevented some backsliding

### **5. Doha Disappointment**

-9<sup>th</sup> major round of world trade negotiations- 2001

-failure of Doha due partly to success from previous negotiations

-in addition to the overall reductions in tariffs that have taken place through multilateral negotiations, some groups of countries have negotiated preferential trading agreements under which they lower tariffs with respect to each other but not the rest of the world

-most trading agreements are nondiscriminatory (MFN status), but some offer preferential status

### ***2 Kinds of Preferential Trading Agreements Allowed Under GATT***

**1. customs unions**- members of the agreement set up common external tariffs

**2. free trade areas**- where the members do not charge tariffs on each other's products but set their own tariff rates against the outside world

-either kind of agreement has ambiguous effects on economic welfare

### ***2 Kinds of Custom Unions Welfare Effects***

**1. trade creation**- if joining such an agreement leads to replacement of high-cost domestic production by imports from other members of the agreement; country wins

**2. trade diversion**- when joining leads to the replacement of low-cost imports from outside the zone with higher-cost goods from member nations; the country loses

## Trade Policy in Developing Countries

### 1. Import-Substituting Industrialisation

-the income level becomes a major disparity between countries; after WWII thought was that the key to high NI was a strong manufacturing sector, and the best way to create that was by protecting domestic manufacturers from international competition

-trade policy in less-developed countries can be analysed using the same analytical tools used to discuss advanced countries; the particular issues characteristic of developing countries are different: trade policy in developing countries is concerned with 2 objectives: promoting industrialisation and with the uneven development of the domestic economy

-government policy to promote industrialisation has often been justified by the infant industry argument, which says that new industries need a temporary period of protection of competition from established competitors in other countries; the infant industry argument is valid only if it can be cast as a market failure argument for intervention; 2 usual justifications are the existence of imperfect capital markets and the problem of appropriability of knowledge generated by pioneering firms

#### Infant Industry Argument

-used by countries to protect their manufacturing industries from WWII to 1970; developing countries have a potential comparative advantage, but they cannot compete initially when international competition can be in the mix; world's largest 3 manufacturing countries all used extensive quotas and tariffs: US, Germany, Japan

#### *3 Problems With*

1. just because can have a comparative advantage in the future, don't go into today
2. protection does no good unless the protection increases competitiveness
3. need a domestic market failure; costly and time-consuming to build industry without government intervention does not suffice—advanced countries still back long-term high cost products

#### *2 Market Failure Justifications For*

1. **imperfect capital markets**- need good capital markets to finance the industry, otherwise the government must intervene
2. **appropriability**- industry's create social benefits which they are not compensated for -special cases of market failure argument for free trade; only difference is that they apply specifically to new industries rather than any industry, very hard to legitimately determine which industries should actually get help

**\*import-substituting industrialisation**- strategy of encouraging domestic industry by limiting imports of manufactured goods

-can't encourage both import substitution and exports; according to general equilibrium analysis for tariffs, a tariff that reduces imports also necessarily reduces exports—by protecting import-substituting industries, countries draw resources away from actual or potential export sectors—so a country's choice to seek to substitute for imports is also a choice to discourage export growth



-using the infant industry argument as justification, many less-developed countries have pursued policies of import-substituting industrialisation in which domestic industries are created under the protection of tariffs or import quotas; although these policies have succeeded in promoting manufacturing, by and large they have not delivered the expected gains in economic growth and living standards; many economists are now harshly critical of the results of import substitution, arguing that it has fostered high-cost, inefficient production

### ***2 Reasons for Import-Substitution Over Export Growth***

-mixture of economics and politics

1. many countries were sceptical about manufacturing exports; they just wanted to substitute
2. import-substituting policies often coincided with existing political biases

-import-substitution proved to not work as well as all had thought, with some countries lagging even further behind

-the most important reason for was that the infant-industry argument was not as universally valid as some had hoped; those same countries often had poor skilled labour and managerial issues that resulted in additional operating deficiencies

-the cost of the trade policies was then examined, with the results being that too detailed and extensive methods were used to calculate gains/costs and to promote the industries; many of these countries were supporting industries with 3 to 4 times the cost of importing

-the smaller economies of scale in these countries also contributed to their inefficiency, as they were not nearly as large as the US or the European Union

-as of lately, developing countries pursuing policies of free trade have experienced more growth

### **2. Trade Liberalisation Since 1985**

-beginning about 1985, many developing countries, dissatisfied with the results of import-substitution policies, greatly reduced rates of protection for manufacturing; as a result, developing-country trade grew rapidly, and the share of manufactured goods in exports rose; the results of this policy change in terms of economic development, however, have been mixed at best

-the shift of these developing countries to free trade is one of the biggest trade policy stories of the last 20 years

#### ***2 Clear Effects of Trade Liberalisation in Developing Countries***

1. dramatic increase in volume of trade
2. change in nature and composition of trade products

-trade liberalisation is a means to an end, not an end itself; import-substitution was not working, so now they are trying this to grow their economies more; still concerns abound

### **3. Export-Oriented Industrialisation: East Asian Miracle**

-the view that economic development must take place via import substitution—and the pessimism about economic development that spread as import-substituting industrialisation seemed to fail—have been confounded by the rapid economic growth of a number of Asian economies; these **high performance Asian economies HPAE** have industrialised not via import substitution but via exports of manufactured goods; they are

characterised both by very high ratios of trade to national income and by extremely high growth rates

-some say the success demonstrates the virtues of relatively free trade and a hands-off government policy; to others it demonstrates the effectiveness of sophisticated government intervention; and there are some economists that believe that trade and industrial policy made little difference either way

### ***3 Groups of HPAEs***

1. WWII- Japan

2. 1960s- 4 Tigers- Hong Kong, Taiwan, South Korea, Singapore

3. 1970s- Malaysia, Thailand, Indonesia, China

-in addition to high growth rates, they all also have relatively open trade and are very export oriented

-in Hong Kong and Singapore, exports exceed GDP, as manufacturing parts are combined for more expensive exports (parts to a suit)

-their trade policies are not necessarily the reason for growth, as many of them still have very protectionist policies; instead, there is a correlation between rapid growth in exports and rapid overall economic growth (human capital increases surely helped)

-another possibility is government intervention, or direction and promoting of certain industries

### ***3 Reasons Government Intervention Not Likely***

1. HPAEs have followed a wide variety of policies, Singapore very government involved, Hong Kong not

2. despite considerable publicity given to industrial policies, those industries have not benefited as much

3. many countries have abandoned their industrial intervention policies

-the reasons for the success of the HPAEs are highly disputed; some observers point to the fact that, while they do not practice free trade, they do have lower rates of protection than other developing countries; others assign a key role to the interventionist industrial policies pursued by some of the HPAEs; recent research suggests, however, that the roots of success may lie largely in domestic causes, especially high savings rates and rapid improvements in education

## Controversies in Trade Policy

### 1. Sophisticated Arguments for Activist Trade Policy

- most economists believe that new ideas are just old fallacies in a new bottle
- some new arguments for government intervention in trade emerged in the 1980s and 1990s; in the 1980s the new theory of strategic trade policy offered reasons why countries may gain from promoting particular industries; in the 1990s a new critique of globalisation emerged, focused on the effects of globalisation on workers in developing countries

### 2 Market Failures in Need of Activist Trade Policy

#### 1. technology and externalities

- governments should promote industries that yield technological externalities, especially when difficulties with appropriating knowledge arise; when benefits accrue to other firms unintentionally
- more so in advanced countries where laissez-faire high-technology firms do not receive as strong an incentive to innovate as they should; reverse engineering is easy
- when deciding whether to subsidise an industry, must ask: can you target the right thing, and what is the qualitative importance of the thing
- can't subsidize the entire part of the industry, like the workers and labour and such; just target R&D; US has a slight subsidy, R&D can be expensed
- hard to measure spill-over externalities, or even how important they are and how much they should be subsidised
- large monopoly industries in 1 country may not be able to be subsidised by their nation, but a world government could subsidise
- still the best argument for an active industrial policy despite the shortcomings

#### 2. imperfect competition and strategic trade policy- Brander-Spencer analysis

- monopoly profits in highly concentrated oligopolistic industries
- excess returns will occur and other countries will enter to get the profits; the government can alter the game and shift these returns to domestic firms with a subsidy that can raise the profits by more than to cover the subsidy and drive out foreign competition
- Brander-Spencer analysis; suggests that strategic intervention can enable nations to capture excess returns; represents a greater departure from standard market failure arguments; should trade agreements include wage rates and labour conditions
- these arguments are theoretically persuasive; however, many economists worry that they are too subtle and require too much information to be useful in practice

### 3 Main Issues

#### 1. insufficient information

- must calculate correctly, and must be able to consider industries in isolation

#### 2. foreign retaliation

- leads to trade wars

#### 3. politics wouldn't allow it

- scepticism and personal favourites

-very hard to select the industry to promote; Japan built RAM chips and so did every one else; eventually they were a common industry

## **2. Globalisation and Low-Wage Labour**

-with the rise of manufactured exports from developing countries, a new movement is with the low wages paid to export workers, although there are other themes as well; the response of most economists is that developing-country workers may earn low wages by Western standards, but that trade allows them to earn more than they otherwise would  
-very low wages and horrible working conditions; where we get a lot of stuff; but it is just comparative advantage

-at first anti-globalisation centred on workers losing jobs in advanced countries; in mid 1990s the topic of third-world labour surfaced on college campuses

-arguments about Mexican workers taking American jobs followed, but analysis proves that globalisation of labour actually improves the purchasing power of wages in both countries; workers in advanced country get high-tech jobs and workers in the developing country at least have jobs; the only possibility is that US workers are hurt, but Mexican workers definitely profit

-capital is internationally mobile, while labour is not

-labour standards could be part of trade negotiations; certified factories could be used, or formal labour requirements could be integrated into export industries trade law

-labour standards could then be used as basis for lawsuits against foreign countries, thereby disrupting international trade sort of like antidumping legislation; politicians in advanced countries could also set standards at levels that developing countries could not meet, pricing them out the market—advanced and developing countries both don't like  
-environmental and cultural issues also arise; substantial environmental damage has been done, especially in developing countries for transport to developed countries; there are also domestic instances where environmental damage occurs however—many developing countries would not be able to keep up with advanced requirements however

-issues of market failure to preserve cultural identity arise, but then the issue of freedom of choice follows

-as many times domestic policy portends trade policy, many have perceived the WTO as a supranational power interfering with domestic activities—usually with reference to favouritism of domestic over foreign products with regards to production standards

-an examination of cases suggests how difficult the discussion of globalisation really is, especially when one tries to view it as a moral issue; it is all too easy for people to do harm when they are trying to do good; the causes most favoured by activists, like labour standards, are feared by developing countries, which they believe will be used as protectionist devices

## **3. Globalisation and the Environment**

-most believe that there is not a simple relationship between globalisation and the environment, and that trade agreements do not prevent countries from having enlightened environmental policies

-to the extent that globalisation promotes economic growth, it has ambiguous effects on the environment

**\*environmental Kuznets curve-** says that economic growth initially tends to increase environmental damage as a country grows richer but that beyond a certain point growth is actually good for the environment as stricter policies are implemented and technology for the environment is given room to improve

-unfortunately, some of the world's fastest growing economies are still relatively poor and on the wrong side of the curve, but over time countries like China should move to the right side of the curve as their economies fully develop

**\*pollution haven-** thanks to international trade, an economic activity that is subject to strong environmental controls in advanced countries can take place in other countries with less regulation; ship breaking down done in India

-there is growing concern that globalisation may allow highly polluting industries to move to pollution havens where regulation is looser; however, there is little evidence that this is a major factor in actual location decisions

-further, pollution is a negative externality, but likely no industries exist now that pose a significant threat to international welfare

-no consensus on whether environmental standards should be in trade policies; some countries do so however

# III. Exchange Rates and Open-Economy Macroeconomics

## National Income Accounting and the Balance of Payments

### 1. National Income Accounts

-shift from microeconomics to macroeconomics

#### 4 Main Issues

1. unemployment
2. saving
3. trade imbalances
4. money and price level

#### 2 Main Tools

1. national income accounting- records all expenditures that contribute to a country's income and output
2. balance of payments accounting- keeps track of changes in a country's indebtedness to foreigners and the fortunes of its export-import competing industries

-international macroeconomics is concerned with the full employment of scarce economic resources and price level stability throughout the world economy; because they reflect national expenditure patterns and their international repercussions, the national income accounts and the balance of payment accounts are essential tools for studying the macroeconomics of open, interdependent economies

-helpful to divide GNP and GDP into the factor inputs for better analysis; GNP is measured more commonly by macroeconomists; GNP is equal to national income

#### 2 Adjustments to Equalise GNP and National Income

1. capital depreciation-  $\text{GNP} - \text{depreciation} = \text{NNP}$  (net national product)
  2. international (unilateral) transfers-  $\text{transfers} + \text{NNP} = \text{national income}$
- difference between GNP and national income is insignificant in perspective, so they are usually used both as GNP
- most countries now use GDP however; movements between GNP and GDP do not vary greatly, but GNP tracks national income more closely than GDP, and national welfare depends more directly on national income than on domestic product
- a country's GNP is equal to the income received by its factors of production; the national income accounts divide national income according to the types of spending that

generate it: consumption, investment, government purchases, and the current account balance; GDP, equal to GNP less net receipts of factor income from abroad, measures the output produced within a country's territorial borders

## 2. National Income Accounting for an Open Economy

-in an economy closed to international trade, GNP must be consumed, invested, or purchased by the government; by using current output to build plant, equipment, and inventories, investment transforms present output into future output; for a closed economy, investment is the only way to save in the aggregate, so the sum of the saving carried out by the public and private sectors (national saving), must equal investment  
 -in an open economy, GNP equals the sum of C, I, G, NX; trade does not have to be balanced if the economy can borrow from and lend to the rest of the world; the difference between the economy's exports and imports, the current account balance, equals the difference between the economy's output and its total use of goods and services

$$Y = C + I + G + EX - IM$$

**\*current account balance, net foreign investment-** difference between EX and IM;

$$CA = EX - IM$$

-changes in the current account can be associated with change in output and employment; the current account also measures the size and direction of international borrowing; a country's current account balance equals the change in its net foreign wealth

$$Y - (C + I + G) = CA$$

-deficits/surpluses lead to importing/exporting present/future consumption

**\*national saving-** portion of output Y that is not devoted to household C or G

-in a closed economy ( $S=I$ ), national saving always equals investment; an open economy can save either by building up its capital stock or by acquiring foreign wealth, but a closed economy can save only by building up its capital stock ( $S=I+CA$ )

-private saving ( $S=Y-T-C$ ) and government saving ( $S=T-G$ ) are interrelated; private saving has 3 uses: I, CA, and government debt ( $G-T$ )

-the current account also equals the country's net lending to foreigners; unlike a closed economy, an open economy can save by domestic and foreign investment; national saving therefore equals domestic investment plus the current account balance

## 3. Balance of Payments Accounts

-balance of payments accounts provide a detailed picture of the composition and financing of the current account; all transactions between a country and the rest of the world are recorded in its balance of payments accounts; the accounts are based on the convention that any transaction resulting in a payment to foreigners is entered with a minus sign while any transaction resulting in a receipt from foreigners is entered with a plus sign

### 3 Transactions Recorded

#### 1. current account

-goods, services, income payments, and net unilateral transfers

#### 2. financial account

-those from the purchase or sale of financial assets; doesn't include financial derivatives

### 3. capital account

-those resulting from transfers of wealth between countries; capital account

**\*balance of payments account**= current account + financial account + capital account=0

-a statistical discrepancy is added because the sides don't balance; credits and debits come from different sources; usually comes from the financial account

**\*official foreign exchange intervention**- central banks buying or selling international reserves in private asset markets to affect macroeconomic conditions in their economies; official international reserves are held by central banks and other government agencies and even private agencies

**\*official settlements balance**- the amount needed to bring the balance of payments to 0; performed by the central bank; the government acts as the exchange counter for domestic industries to engage in international trade—need to keep a war chest of international currency to prevent losing ability to get foreign financing; normally just issue debt, but may need actual currency at times

-transactions involving goods and services appear in the current account of the balance of payments, while international sales or purchases of assets appear in the financial account; the capital account records mainly nonmarket asset transfers and tends to be small for the US; any current account deficit must be matched by an equal surplus in the other 2 accounts of the balance of payments, and any current account surplus by a deficit somewhere else; this feature of the accounts reflects the fact that discrepancies between export earnings and import expenditures must be matched by a promise to repay the difference with interest in the future

-international asset transactions carried out central banks are included in the financial account; any central bank transaction in private markets for foreign currency assets is called official foreign exchange intervention; 1 reason intervention is important is that central banks use it as a way of altering the amount of money in circulation; a country has a deficit in its balance of payments when it is running down its official international reserves or borrowing from foreign central banks; it has a surplus in the opposite case



## Exchange Rates and the Foreign Exchange Market: An Asset Approach

### 1. Exchange Rates and International Transactions

-as exchange rates are also an asset price, the principles governing the behaviour of other asset prices also govern the behaviour of exchange rates

-the defining characteristic of an asset is that it is a form of wealth, a way of transferring purchasing power from the present into the future; the asset's price today is directly related to its purchasing power in the future—similarly, today's exchange rates reflect future prospects

-all else equal, a depreciation of a country's currency makes its goods cheaper for foreigners and imports more expensive for domestic citizens; an appreciation of a country's currency makes its goods more expensive for foreigners and imports cheaper for domestic citizens

-all else equal, an appreciation of a country's currency raises the relative price of its exports and lowers the relative price of its imports; conversely, a depreciation lowers the relative price of a country's exports and raises the relative price of its imports

-an exchange rate is the price of 1 country's currency in terms of another country's currency; exchange rates play a role in spending decisions because they enable us to translate different countries' prices into comparable terms; all else equal, a depreciation of a country's currency against foreign currencies makes its exports cheaper and its imports more expensive; an appreciation of its currency makes its exports more expensive and its imports cheaper

### 2. Foreign Exchange Market

-just like other prices in the economy, exchange rates are determined by the interaction of buyers and sellers—households, firms, and financial institutions—that buy and sell foreign currencies to make international payments

#### *4 Major Actors*

#### **1. commercial banks**

-centre of the market; most FOREX transactions involve trading of bank deposits denominated in different currencies

\***interbank trading**- foreign currency trading among banks; banks quote rates for other banks and trade for their big corporate customers; majority of activity

#### **2. corporations**

-multinational corporations

#### **3. nonbank financial institutions**

-hedge funds and insurance companies

#### **4. central banks**

-may not be large transactions, but still important; look for macroeconomic policy indicators

## **Largest Markets**

1. London
2. New York
3. Tokyo
4. Frankfurt
5. Singapore

-24 hour instant access market; this implies arbitrage opportunities are rare

**\*vehicle currency**- 86% of transactions involve US dollars for another currency; the US dollar is the defacto currency of choice—easier than finding someone with an obscure currency

-spot rates are for today; forward rates are traded at the value date in the future (hedging risk)

-swaps are exchanges of payments streams to avoid brokerage fees when the currency will be needed again in the future to pay debts

-futures contracts are different from forwards in that they are traded on organised exchanges; put and call options are available—all are financial derivatives

-exchange rates are determined in the FOREX; the major participants in that market are commercial banks, international corporations, nonbank financial institutions, and national central banks; commercial banks play a pivotal role in the market because they facilitate the exchanges of interest-bearing bank deposits that make up the bulk of FOREX; even though foreign exchange trading takes place in many financial centres around the world, modern telecommunications technology links those centres together into a single market that is open 24 hours a day; an important category of FOREX trading is forward trading, in which parties agree to exchange currencies on some future date at a prenegotiated exchange rate; in contrast, spot trades

## **3. Demand for Foreign Currency Assets**

-like other assets, foreign exchange values are determined by demand

-because the exchange rate is the relative price of 2 assets, it is most appropriately thought of as being an asset price itself; the basic principle of asset pricing is that an asset's current value depends on its expected future purchasing power; in evaluating an asset, savers look at the expected rate of return it offers, the rate at which the value of an investment in the asset is expected to rise over time; it is possible to measure an asset's expected rate of return in different ways, each depending on the units in which the asset's value is measured; savers care about an asset's expected real rate of return, the rate at which its value expressed in terms of a representative output basket is expected to rise

### **2 Primary Factors**

#### **1. interest rates**

-large denominations make large interest payments; different currencies get different rates; different rates have different returns—can vary widely

#### **2. exchange rates**

-expected changes in currency's exchange rate against other currencies; could be many different currencies measured against each other; 1 on 1 in a table

## 2 Steps

**1. rate of depreciation, appreciation-** % increase in dollar/euro exchange rate over a year

**2. simple rule-** the dollar rate of in euro deposits is approximately the euro interest rate plus the rate of depreciation of the dollar against the euro

-to translate the euro return on euro deposits in dollar terms, you must add the rate at which the euro's dollar price rises over a year to the euro interest rate

-when the difference is positive, dollar deposits yield the higher expected rate of return; when it is negative, euro deposits yield the higher expected rate of return

-it makes no difference which currency is used for measurement

-risk and liquidity in the FOREX market varies widely; these seem to be of limited importance however, as the market moves very quickly

-we hold assets to get returns in the future; as with other assets, the real rate of return as compared to other baskets of goods is relevant; also look for risk and liquidity

-when relative asset returns are relevant, as in the foreign exchange market, it is appropriate to compare expected changes in assets' currency values, provided those values are expressed in the same currency; if risk and liquidity factors do not strongly influence demands for foreign currency assets, participants in the foreign exchange market always prefer to hold those assets yielding the highest expected rate of return

-the returns on deposits traded in the FOREX market depend on interest rates and expected future exchange rate changes; to compare the expected rates of return offered by dollar and euro deposits, the return on euro deposits must be expressed in dollar terms by adding to the euro interest rate the expected rate of depreciation of the dollar against the euro (or the euro against the dollar) over the deposit's holding period

## 4. Equilibrium in the Foreign Exchange Market

-the exchange rate at which the market settles is the one that makes market participants content to hold existing supplies of all currencies; when market participants willingly hold the existing supplies of deposits of all currencies, the foreign exchange market is in equilibrium; requires interest rate parity

-the foreign exchange market is an equilibrium when deposits of all currencies offer the same expected rate of return

**\*interest rate parity condition-** when the expected rates of return on deposits of any 2 currencies are equal when measured in the same currency; implies that potential holders of foreign currency deposits view them all as equally desirable assets, provided their expected rates of return are the same

**\*covered interest rate parity condition-** includes forward exchange rates; the interest rate on dollar deposits equals the interest rate on euro deposits plus the forward premium on euros against dollars (forward discount on dollars against euros)

-to maintain covered interest rate parity, spot and forward rates for the corresponding maturities must change roughly in proportion to each other

-very important to understand how changes in the current exchange rate affect expected returns when interest and exchange (expected future price) rates do not change:  
depreciation of a country's currency today lowers the expected domestic currency return

on foreign currency deposits—appreciation of the domestic currency today, all else equal, raises the domestic currency return expected of foreign currency deposits

- exchange rates always adjust to maintain interest rate parity; when parties are unwilling to hold a specific currency at the current exchange rate and interest rates, the FOREX market is out of equilibrium—the currencies must depreciate and appreciate
- equilibrium in the FOREX market requires interest parity; that is, deposits of all currencies must offer the same expected rate of return when returns are measured in comparable terms

### **5. Interest Rates, Expectations, and Equilibrium**

- for any given interest rates and a given expectation of the future exchange rate, the interest parity condition tells us the current equilibrium exchange rate; when the expected dollar return on euro deposits exceeds that on dollar deposits, the dollar immediately depreciates against the euro

- other things equal, a dollar depreciation today reduces the expected dollar return on euro deposits by reducing the depreciation rate of the dollar against the euro expected for the future; similarly, when the expected return on euro deposits is below that on dollar deposits, the dollar must immediately appreciate against the euro

- other things equal, a current appreciation of the dollar makes euro deposits more attractive by increasing the dollar's expected future depreciation against the European currency

- all else equal, a rise in dollar interest rates causes the dollar to appreciate against the euro while a rise in euro interest rates causes the dollar to depreciate against the euro; today's exchange rate is also affected by changes in its expected future level; if there is a rise in the expected future level of the dollar/euro rate, then at unchanged interest rates, today's dollar/euro exchange rate will also rise

- an increase in the interest paid on deposits of a currency causes that currency to appreciate against foreign currencies

- in many cases, a change in the expected future exchange rate will be accompanied by a change in the expected future exchange rate—this change in the expected future exchange rate depends in turn on the economic causes of the interest rate change, although this is difficult in the real world

- all else equal, a rise in the expected future exchange rate causes a rise in the current exchange rate; similarly, a fall in the expected future exchange rate causes a fall in the current exchange rate

## Money, Interest Rates, and Exchange Rates

### 1. Money Defined

- one of the most powerful determinants of a country's exchange and interest rates are the money supply and money demand factors, as the exchange rate is the price of the money
- expectations of future exchange rates are closely linked to expectations about the future money prices of countries' products—these price movements in turn depend on changes in money supply and demand
- how monetary influences affect output prices (exchange rates) along with interest rates

### 3 *Characteristics of Money*

1. medium of exchange
2. unit of account
3. store of value

-many different definitions of money, M1 is the most ubiquitous—money supply is determined by central bank policy

### 2. Demand for Money by Individuals

- liquidity has no relevant role in the FOREX market, it is the most important reason people hold money—what determines how much money people want to hold

### 3 *Influences on Demand for Assets (Money)*

1. **expected return**- rises in interest rates cause demand for money to fall (opportunity cost)
2. **risk**- not important factor in money demand—only risky to hold money with hyperinflation
3. **liquidity**- main benefit- a rise in the average value of transactions carried out by a household or firm causes its demand for money to rise

### 3. Aggregate Money Demand

- aggregate money demand is just the sum of all individual money demand; demand for money by all households and firms in the economy

### 3 *Main Factors Affecting Aggregate Demand*

1. interest rate
2. price level
3. real national income

-at a given real income level, real money demand rises as the interest rate falls; downward-sloping real money demand schedule; an increase in real income raises the demand for real money balances at every level of the interest rate and causes the whole demand schedule to shift upward

-money is held because of its liquidity; when considered in real terms, aggregate money demand is not a demand for a certain number of currency units but is instead a demand for a certain amount of purchasing power—aggregate real money demand depends negatively on the opportunity cost of holding money (measured by the domestic interest

rate) and positively on the volume of transactions in the economy (measured by real GNP)

#### **4. Equilibrium Interest Rate: Interaction of Money Supply and Demand**

-the money market is in equilibrium when the money supply set by the central bank equals aggregate money demand—the interest rate is determined by money market equilibrium

-the market always moves toward an interest rate at which the real money supply equals aggregate real money demand; if there is initially an excess supply of money, the interest rate falls, and if there is initially an excess demand, the interest rate rises

-an increase in the money supply lowers the interest rate, while a fall in the money supply raises the interest rate, given the price level and output

-an increase in real output raises the interest rate, while a fall in real output lowers the interest rate, given the price level and the money supply

-the money market is in equilibrium when the real money supply equals aggregate real money demand; with the price level and real output given, a rise in the money supply lowers the interest rate and a fall in the money supply raises the interest rate; a rise in real output raises the interest rate, given the price level, while a fall in real output has the opposite effect

#### **5. Money Supply and the Exchange Rate in the Short Run**

-just as shifts in a country's money supply affect the interest rate on nonmonetary assets denominated in its currency, monetary changes also affect the exchange rate

-an increase in a country's money supply causes its currency to depreciate in the FOREX market, while a reduction in the money supply causes its currency to appreciate in the FOREX market

-monetary policy actions by the central bank affect the interest rate, changing the dollar/euro exchange rate that clears the FOREX market

-by lowering the domestic interest rate, an increase in the money supply causes the domestic currency to depreciate in the FOREX market (even when expectations of future exchange rates do not change); similarly, a fall in the domestic money supply causes the domestic currency to appreciate against foreign currencies

#### **6. Money, Price Level, and the Exchange Rate in the Long Run**

-all things equal, an increase in a country's money supply causes a proportional increase in its price level

**\*long-run equilibrium-** the position the economy would eventually reach if no new economic shocks occurred during the adjustment to full employment

-a change in the supply of money has no effect on the long-run values of the interest rate or real output

-a permanent increase in the money supply causes a proportional increase in the price level's long run value; in particular, if the economy is initially at full employment, a permanent increase in the money supply eventually will be followed by a proportional increase in the price level

-a permanent increase in a country's money supply causes a proportional long run depreciation of its currency against foreign currencies; similarly, a permanent decrease in

a country's money supply causes a proportional long run appreciation of its currency against foreign currencies

-the assumption that the price level is given in the short run is a good approximation to reality in countries with moderate inflation, but it is a misleading assumption over the long run; permanent changes in the money supply push the long-run equilibrium price level proportionally in the same direction but do not influence the long run values of output, the interest rate, or any relative prices

-1 important money price whose long run equilibrium level raises in proportion to a permanent money supply increase is the exchange rate, the domestic currency price of foreign currency

### **7. Inflation and Exchange Rate Dynamics**

-inflation is when the price level is rising and deflation is when the price level is dropping

-prices generally are short run sticky while exchange rates are short run flexible; some prices are flexible in short run like agricultural products traded at markets, but most are not

-wages, although sticky, do not actually enter the indices of the price level directly, but rather make up a large fraction of the cost of producing goods and services

-can always be scenarios when this stickiness doesn't hold; like hyperinflation

#### ***3 Main Sources of Future Inflation Pressure from a Change in the Money Supply***

-even though prices may remain sticky in the short run

1. excess demand for output and labour
2. inflationary expectations
3. raw materials prices

-an increase in the money supply can cause the exchange rate to overshoot its long run level in the short run; if output is given, a permanent money supply increase, causes a more than proportional short run depreciation of the currency, followed by an appreciation of the currency to its long run exchange rate

**\*exchange rate overshooting-** when the immediate response to a disturbance is greater than its long run response; explains why exchange rates move so sharply from day to day

-heightens the volatility of exchange rates; is a direct result of sluggish short run price level adjustment and the interest parity condition

-overshooting is a direct consequence of the short run rigidity of the price level; in a hypothetical world where the price level could adjust immediately to its new long run level after a money supply increase, the dollar interest rate would not fall because prices would adjust immediately and prevent the real money supply from rising—thus, there would be no need for overshooting to maintain equilibrium in the foreign exchange market—the exchange rate would maintain equilibrium simply by jumping to its new long run level right away

## Price Levels and the Exchange Rate in the Long Run

### 1. Law of 1 Price

-exchange rates are determined by interest rates and expectations about the future, which are in turn affected by conditions in the national money markets

-must also account for linkages in among monetary policies, inflation, interest rates, and exchange rates; also must consider factors other than money supplies and demands such as shifts in demand markets for goods and services that also have sustained effects on exchange rates

-in the exchange rate market, predictions about long run movements also are important in the short run because exchange rates are effected immediately

-in the long run national price levels play a key role in determining both interest rates and the relative prices at which countries' products are traded—thus a theory combining the influences of exchange rates and national price levels on each other is important

**\*law of 1 price-** building block of the PPP; states that under free competition and in the absence of trade impediments, a good must sell for a single price regardless of where in the world it is sold; proponents of the PPP theory often argue, however, that its validity does not require the law of 1 price to hold for every commodity

### 2. Purchasing Power Parity

-law of 1 price applies to individual commodities and PPP applies to the general price level

-PPP asserts that even when law of 1 price doesn't hold, prices and exchange rates should not stray too far from the relation predicted by PPP; when goods and services become temporarily more expensive in 1 country than in others, the demand for its currency and its products fall, pushing the exchange rate and domestic prices back in line with PPP; the opposite situation of relatively cheap domestic prices products lead, analogously, to currency appreciation and price level inflation

-PPP this asserts that even the law of 1 price is not literally true, the economic forces behind it will help eventually to equalise a currency's purchasing power in all countries

-domestic purchasing power of a country's currency is reflected in the country's price level, the money price of a reference basket of goods and services

-PPP asserts that a fall in a currency's domestic purchasing power (increase in domestic price level) will be associated with a proportional currency depreciation in the foreign exchange market—similarly, increase in the currency's domestic purchasing power will be associated with a proportional currency appreciation

**\*purchasing power parity theory, absolute PPP-** in its absolute form, asserts that the exchange rate between countries' currencies equals the ratio of their price levels, as measured by the money prices of a reference commodity basket; an equivalent statement of PPP is that the purchasing power of any currency is the same in any country



**\*relative PPP**- absolute PPP implies a second version of the PPP theory, relative PPP, which predicts that % changes in exchange rates equals differences in national inflation rates

-relative PPP thus translates into absolute PPP from a statement about price and exchange rate levels into one about price and exchange rate changes—it asserts that prices and exchange rates change in a way that preserves the ratio of each currency's domestic and foreign purchasing powers

-as national governments do not create internationally standardised baskets, absolute PPP is hard to measure; relative PPP therefore comes in handy when we have to rely on government price level statistics to evaluate PPP—it makes logical sense to compare % exchange rate changes to inflation differences, even when countries base their price level estimates on product baskets that differ in coverage and composition

-relative PPP is important also because it may be valid even when absolute PPP is not; provided the factors causing deviations from absolute PPP are more or less stable over time, % changes in relative price levels can still approximate % changes in exchange rates

### **3. Long-Run Exchange Rate Model Based on PPP**

the monetary approach is a long run and not a short run theory because it does not allow for the price rigidities that seem important in explaining short run macroeconomic developments, in particular departures from full employment—instead the monetary approach proceeds as if prices can adjust right away to maintain full employment as well as PPP

**\*monetary approach to the exchange rate**- uses PPP to explain long-term exchange rate behaviour exclusively in terms of money supply and demand; in that theory, long-run international interest differentials result from different national rates of ongoing inflation, as the Fisher effect predicts

-sustained international differences in monetary growth rates are, in turn, behind different long-term rates of continuing inflation; the monetary approach thus finds that a rise in a country's interest rate will be associated with a depreciation of its currency—relative PPP implies that international interest differences, which equal the expected % change in the exchange rate, also equal the international inflation gap

-the monetary approach therefore makes the general prediction that the exchange rate, which is the relative price of American and European money, is fully determined in the long run by the relative supplies of those monies and the relative real demands for them—shifts in interest rates and output levels affect the exchange rate only through their influences on money demand

#### ***3 Predictions of Monetary Approach***

-these predictions assume price levels adjust immediately as exchange rates do

##### **1. money supplies**

-permanent increases in money supply cause proportional increases long run price level and thus a depreciation of the currency

##### **2. interest rates**

-rises in interest rates lowers money demand, long run price level rises and under PPP the dollar must depreciate

##### **3. output levels**

-rise in output raises money demand, leading to a fall in price levels; under PPP the dollar appreciates

-monetary approach leads to the conclusion that the long run foreign exchange value of a country's currency moves in proportion to its money supply—a paradox arises in that PPP says that currency depreciates when interest rates rise, as previous theory states that currency appreciates when interest rates rise—we must clarify why interest rates have changed

-a permanent increase in the level of a country's money supply ultimately results in a proportional rise in its price level but has no effect on the long-run values of the interest rate or real output—conceptually correct, but not realistic, in reality the monetary authority institutes a growth rate %

-other things equal, money supply growth at a constant rate eventually results in ongoing price level inflation at the same rate, but changes in this long run inflation rate do not affect the full-employment output level or the long run relative prices of goods and services

-the interest rate is not independent of the money supply growth rate (inflation) in the long run; if people expect relative PPP to hold, the difference between the interest rates offered by dollar and euro deposits will equal the difference between the inflation rates expected, over the relevant horizon, in the US and Europe

**\*Fisher effect-** long run relationship between inflation and the interest rates; all else equal, a rise in a country's expected inflation rate will eventually cause an equal rise in the interest rate that deposits of its currency offer—similarly, a fall in the expected inflation rate will eventually cause a fall in the interest rate

-the Fisher effect is behind the seemingly paradoxical monetary approach prediction that a currency depreciates in the foreign exchange market when its interest rate rises relative to foreign currency interest rates—in the long run equilibrium assumed by the monetary approach, a rise in home interest rates relative to foreign occurs only when expected home inflation rises above expected foreign inflation rates

-in the short run when domestic prices are sticky however, the interest rate can rise when the domestic money supply falls because the sticky domestic price level leads to an excess demand for real money balances at the initial interest rate

-thus, different assumptions about the speed of price level adjustment lead to contrasting predictions about how exchange and interest rates interact; in the stick price case an interest rate rise is associated with lower expected inflation and a long run currency appreciation, so the currency appreciates immediately—in the monetary approach (flexible short run prices), a rise in the money supply growth leads to an interest rate increase associated with higher expected inflation and a currency that will be weaker on all future dates (an immediate currency depreciation is the result)

-thus an explanation of exchange rates based on interest rates must carefully account for the factors that cause interest rates to move

#### **4. Empirical Evidence on PPP and the Law of 1 Price**

-the empirical support for PPP and the law of 1 price is weak in recent data; the failure of these propositions in the real world is related to trade barriers and departures from free competition, factors that can result in pricing to market by exporters—in addition,

different definitions of price levels in different countries bedevil attempts to test PPP using the price indices governments publish

-for some products, including many services, international transport costs are so steep that these products are nontradable

## **5. Explaining the Problem With PPP**

-several immediate problems with rationale for the PPP theory of exchange rates, which is based on the law of 1 price

### **3 Problems**

#### **1. trade barriers and nontradables**

-transportation costs and restrictions do exist—may be high enough to prevent some goods and services from being traded between countries

#### **2. departures from free competition**

-monopolistic or oligopolistic practices in goods markets may interact with transport costs and other trade barriers to weaken further the link between the prices of similar goods sold in different countries; pricing to market

#### **3. differences in consumption patterns and price level measurement**

-because the inflation data reported in different countries are based on different commodity baskets, there is no reason for exchange rate changes to offset official measures of inflation differences, even when there no barriers to trade and all products are tradable

-departures from PPP can be greater in the short run than in the long run

-nontradables tend to be more expensive (relative to tradables) in richer countries

-deviations from relative PPP can be viewed as changes in a country's real exchange rate, the price of a typical foreign expenditure basket in terms of the typical domestic expenditure basket; all else equal, a country's currency undergoes a long-run real appreciation against foreign currencies when the world relative demand for its output rises; in this case, the country's real exchange rate as just defined falls—the home currency undergoes a long-run real depreciation against foreign currencies when home output expands relative to foreign output—in this case, the real exchange rate rises

## **6. Beyond PPP: A General Model of Long-Run Exchange Rates**

-the monetary approach which assumes PPP is too simply to give accurate predictions about the real world, but we can generalise it by taking account of some of the reasons why PPP predicts badly in practice

-with regards to the real and nominal exchange rates, the US price level will place a relatively heavy weight on commodities produced and consumed in America, and the European price level a relatively heavy weight on commodities produced and consumed in Europe

### **2 Cases that Explain Why the Long Run Values of Real Exchange Rates Can Change**

1. a change in world relative demand for American products- an increase in the world relative demand for US output causes a long run real appreciation of the dollar against the euro—similarly, a fall in world relative demand for US output causes a long run real depreciation of the dollar against the euro

2. a change in relative output supply—a relative expansion of US output causes a long run real depreciation of the dollar against the euro—a relative expansion of European output causes a long run real appreciation of the dollar against the euro

-for a given real dollar/euro exchange rate, changes in money demand or supply in Europe or the US affect the long run nominal dollar/euro exchange rate as in the monetary approach—changes in the long run real exchange rate, however, also affect the long run nominal exchange rate

#### ***4 Main Determinants of Long Run Swings in Nominal Exchange Rates***

1. a shift in relative money supply levels
2. a shift in relative money supply growth rates
3. a change in relative output demand
4. a change in relative output supply

-we conclude that all disturbances are monetary in nature, exchange rates obey relative PPP in the long run; in the long run, a monetary disturbance affects only the general purchasing power of a currency, and this change in purchasing power changes equally the currency's value in terms of domestic and foreign goods; when disturbances occur in output markets, the exchange rate is unlikely to obey relative PPP, even in the long run

-the long-run determination of nominal exchange rates can be analysed by combining 2 theories: the theory of long-run real exchange rate and the theory of how domestic monetary factors determine long-run price levels

-a step wise increase in a country's money stock ultimately leads to a proportional increase in its price level and a proportional fall in its currency's foreign exchange value, just as relative PPP predicts; changes in monetary growth rates also have long-run effects consistent with PPP; supply or demand changes in output markets, however, cause exchange rate movements that do not conform to PPP

### **7. International Interest Rate Differences and the Real Exchange Rate**

-relative PPP, when combined with interest parity, implies that international interest rate differences equal differences in countries' expected inflation rates; but because relative PPP does not hold true, the Fisher effect (interest rates and inflation) must include real exchange rates

#### ***2 Components of Dollar/Euro Interest Differences***

1. expected rate of real dollar depreciation against the euro
2. expected inflation difference between the US and Europe

### **8. Real Interest Parity**

-the interest parity condition equates international differences in nominal interest rates to the expected % change in the nominal exchange rate; if interest parity holds in this sense, a real interest parity condition equates international differences in expected real interest rates to the expected changes in the real exchange rate; real interest parity also implies that international differences in nominal interest rates equal the difference in expected inflation plus the expected % increase in the real exchange rate

-we cannot predict how a rise in the dollar interest rate will affect the dollar's exchange rate without knowing why the nominal interest rate has risen; in a flexible price model in which the home nominal interest rate rises because of higher expected future money supply growth, the home currency will depreciate, not appreciate, thanks to expectations of more rapid future depreciations

## Output and the Exchange Rate in the Short Run

### 1. Determinants of Aggregate Demand in an Open Economy

-combining the model of output markets with that of the foreign exchange and money markets (asset markets) gives us an explanation of the short run behaviour of all the important macroeconomic variables in an open economy  
 -because output changes may push the economy away from full employment, the links among output and other macroeconomic variables such as the merchandise trade balance and the current account are of great concern to economic policy makers

-the productive factors can be over or under supplied in the short run as a result of shifts in AD that have not yet had their full long run effects on prices  
 -the aggregate demand for an open economy's output consists of 4 components, corresponding to the 4 components of GNP: C, I, G, NX (current account); an important determinant of the current account is the real exchange rate, the ratio of the foreign price level (measured in domestic currency) to the domestic price level and disposable income  
 -AD is a function of the real exchange rate, disposable income, I, and G; if all other factors remain unchanged, a rise in output (real income) Y, increase AD—because the increase in AD is less than the increase in output, the slope of the AD function is less than 1

### 2. Equation of Aggregate Demand

-a real depreciation of the home currency raises AD for home output, other things equal: a real appreciation lowers AD for home output  
 -a rise in domestic real income raises AD for home output, other things equal, and a fall in domestic real income lowers AD for home output

### 3. How Output is Determined in the Short Run

-output is determined in the short run by the equality of AD and AS; when AD is greater than output, firms increase production to avoid unintended inventory depletion; when aggregate demand is less than output, firms cut back production to avoid unintended accumulation of inventories  
 -output settles where AD equals aggregate output in the short run

### 4. Output Market Equilibrium in the Short Run: The DD Schedule

-any rise in the real exchange rate  $EP^*/P$  will cause an upward shift in the AD function and an expansion of output, all else equal; similarly, any fall in the real exchange rate, regardless of its cause, will cause output to contract, all else equal  
 \***DD schedule**- shows all combinations of output and exchange rates in the short run that must hold when the output market is in equilibrium  
 -a rise in the exchange rate (depreciation), raises AD and output  
 -the DD schedule slopes upward because a rise in the exchange rate causes output to rise

#### *Factors that Shift the DD Schedule*

1. change in G
  2. change in T
  3. change in I
  4. change in P
  5. change in  $P^*$
  6. change in C function
  7. demand shift between foreign and domestic goods
- any disturbance that raises AD for domestic output shifts the DD schedule to the right;  
 -any disturbance that lowers AD for domestic output shifts the DD schedule to the left

### **5. Asset Market Equilibrium in the Short Run: The AA Schedule**

-the DD schedule is the first element of short run equilibrium; it ensures the exchange rate and output level are consistent with output market equilibrium, but must also be consistent with asset market equilibrium

**\*AA schedule-** the schedule of exchange rate and output combinations that are consistent with equilibrium in the domestic money market and the foreign exchange market

-for asset markets to remain in equilibrium, a rise in domestic output must be accompanied by an appreciation of the domestic currency, all else equal, and a fall in domestic output must be accompanied by a depreciation

#### ***Factors that Shift the AA Schedule***

1. change in M
2. change in  $E^*$
3. change in  $R^*$
4. change in real money demand
5. change in P

-rises in the first 3 cause an upward shift in the AA schedule; rises in the last 2 cause a downward shift in the AA schedule

-the asset market equilibrium schedule AA slopes downward because a rise in output causes a rise in the home interest rate and a domestic currency appreciation

### **6. Short-Run Equilibrium for an Open Economy: Putting the DD and AA Schedules Together**

-the short run equilibrium of the economy occurs where the output market (DD Schedule) and asset market (AA Schedule) simultaneously clear

-the economy's short run equilibrium occurs at the exchange rate and output level where—given the price level, the expected future exchange rate, and foreign economic conditions—AD equals AS and the asset markets are in equilibrium—in a diagram with the exchange rate and real output on its axes, the short run equilibrium can be visualised as the intersection of an upward sloping DD schedule, along which the output market clears, and a downward sloping AA schedule, along which the asset markets clear

-because asset markets adjust very quickly, the exchange rate jumps down immediately; the economy then moves down to point 1 as output rises to meet AD

## 7. Temporary Changes in Monetary and Fiscal Policy

- government macroeconomic policies affect output and the exchange rate also
- with temporary policy shifts, the public expects them to be reversed in the near future; the expected future exchange rate is now assumed to equal the long run exchange rate, the one that prevails once full employment is reached and domestic prices have adjusted fully to past disturbances in the output and asset markets—in line with this, interpretation, a temporary policy change does not affect the long run expected exchange rate
- assume the foreign interest rate  $R^*$ , price level  $P^*$ , and domestic price level  $P$  are fixed in the short run
- a temporary increase in the money supply, which does not alter the long-run expected exchange rate, causes a depreciation of the currency and a rise in output; temporary fiscal expansion also results in a rise in output, but it causes the currency to appreciate—monetary and fiscal policy can be used by the government to offset the effects of disturbances to output and employment
- a temporary fall in world demand shifts the DD schedule upward and reduces output, causing currency to depreciate; temporary fiscal expansion can restore full employment by shifting the DD schedule back to its original position; temporary monetary expansion can restore full employment by shifting the AA schedule upward—the 2 policies differ in their exchange rate effects: the fiscal policy restores the currency to its previous value; the monetary policy causes the currency to depreciate further
- after a temporary money demand increase, either an increase in the money supply or a temporary fiscal expansion can be used to maintain full employment—the 2 policies have different exchange rate effects: the monetary policy restores the exchange rate and the fiscal policy leads to greater appreciation

## 8. Inflation Bias and Other Problems of Policy Formulation

- there are still problems which can arise that prevent the economy from maintaining full employment

### *5 Problems That Can Arise*

1. sticky nominal prices lead governments to raise output when it is abnormally low and manipulate economy close to an election; inflation bias in macroeconomic policy
2. determining whether disturbances originate in the output or asset markets
3. bureaucratic necessities normally determine real world policy choices
4. government budget issues
5. lags are hard to quantify in real world

## 9. Permanent Shifts in Monetary and Fiscal Policy

- permanent shifts in the money supply, which do alter the long run expected exchange rate, cause sharper exchange rate movements and therefore have stronger short run effects on output than transitory shifts; if the economy is at full employment, a permanent increase in the money supply leads to a rising price level that ultimately reverses the effect on the real exchange rate of the nominal exchange rate's initial depreciation; in the long run, output returns to its initial level and all money prices rise in proportion to the increase in the money supply
- after a permanent money supply increase, a steadily increasing price level shifts the DD and AA schedules to the left until a new long run equilibrium point is reached



-because permanent fiscal expansion changes the long run expected exchange rate, it causes a sharper currency appreciation than an equal temporary expansion; if the economy starts out in long run equilibrium, the additional appreciation makes domestic goods and services so expensive that the resulting crowding out of net export demand nullifies the policy's effect on output and employment—in this case, a permanent fiscal expansion has no expansionary effect at all

-shifts AA schedule leftward and shifts DD schedule to the right; the effect on output is nil if the economy starts in long run equilibrium; a comparable temporary fiscal expansion, in contrast, would leave the economy at the same point

-if the economy starts at long run equilibrium, a permanent change in fiscal policy has no net effect on output; instead, it causes an immediate and permanent exchange rate jump that offsets exactly the fiscal policy's direct effect on AD

### **10. Macroeconomic Policies and the Current Account**

-a major practical problem is to ensure that the government's ability to stimulate the economy does not tempt it to gear policy to short term political goals, thus creating an inflation bias—other problems include the difficulty in identifying the sources or durations of economic changes and time lags in implementing policies

-monetary expansion raises the economy's exchange rate and output and thus raises the CA balance; temporary fiscal expansion moves the economy's exchange rate down while permanent fiscal expansion moves the economy's exchange rate and output down—in either case the CA balance falls

-monetary expansion causes the CA balance to increase in the short run; expansionary fiscal policy reduces the CA balance

### **11. Gradual Trade Flow Adjustment and Current Account Dynamics**

-an important assumption of the DD-AA model is that, other things equal, a real depreciation of the home currency immediately improves the CA while a real appreciation of the home currency causes the CA immediately to worsen; in reality there are more complicated issues that arise

-if exports and imports adjust gradually to real exchange rate changes, the current account may follow a J-curve pattern after a real currency depreciation, first worsening and then improving—if such a J-curve exists, currency depreciation may have a contractionary initial effect on output, and exchange rate overshooting will be amplified; limited exchange rate pass-through, along with domestic price increases, may reduce the effect of a nominal exchange rate change on the real exchange rate

\***J-curve**- describes the time lag with which a real currency depreciation improves the current account; sometimes a country's CA worsens immediately after a real currency depreciation and begins to improve only some months later, contrary to the DD schedule assumption

-J-curve effects normally last about 6 months but less than a year

-by introducing an additional source of overshooting, J-curve effects amplify the volatility of exchange rate

-to understand fully how nominal exchange rate movements affect the CA in the short run, one must examine more closely the linkage between the nominal exchange rate and the prices of exports and imports

**\*pass through-** the % by which import prices rise when the home currency depreciates by 1%; degree of pass through from the exchange rate to import prices in the short run -exchange-rate pass through can be incomplete however, and 1 reason for this is international market segmentation

-thus, while a permanent nominal exchange rate change may be fully reflected in import prices in the long run, the degree of pass-through may be far less than 1 in the short run -incomplete pass-through will have complicated effects, however, on the timing of CA adjustment—on one hand, the short0run J-curve effect of a nominal currency change will be dampened by a low responsiveness of import prices to the exchange rate; on the other hand, incomplete pass-through implies that currency movements have less than proportional effects on the relative prices determining trade volumes—the failure of relative prices to adjust quickly will in turn be accompanied by a slow adjustment of trade volumes

-the link between nominal and real exchange rates may be further weakened by domestic price responses—to the extent that a country's export prices rise when its currency depreciates, any favourable effect on its competitive position in world markets will be dissipated—such price increases, however, like partial pass-through, may weaken the J-curve

**\*Marshall-Lerner condition-** all else equal, a real depreciation improves the CA if export and import volumes are sufficiently elastic with respect to the real exchange rate

## Fixed Exchange Rates and Foreign Exchange Intervention

### 1. Why Fixed Exchange Rates?

- we assumed completely flexible exchange rates to understand how a country's exchange rate and national income are determined by the interaction of asset and output markets
- most countries use a managed floating exchange rate, but some developing countries still use more of a fixed rate system
- central banks can intervene in the foreign exchange market to fix exchange rates and use macroeconomic policies to work when exchange rates are fixed

#### *4 Reasons to Study Fixed Exchange Rates*

1. managed floating- dirty v. clean float
2. regional currency arrangements- monetary unions
3. developing countries and countries in transition
4. lessons of the past for the future

### 2. Central Bank Intervention and the Money Supply

- main tool for studying central bank transactions in asset markets is the central bank balance sheet
- there is a direct link between central bank intervention in the foreign exchange market and the domestic money supply; when a country's central bank purchases foreign assets, the country's money supply automatically increases; similarly, a central bank sale of foreign assets automatically lowers the money supply; the central bank balance sheet shows how foreign exchange intervention affects the money supply because the central bank's liabilities, which rise or fall when its assets rise or fall, are the base of the domestic money supply process
- any central bank purchase of assets automatically results in an increase in the domestic money supply, while any central bank sale of assets automatically causes the money supply to decline
- \*sterilised foreign exchange intervention-** central banks carrying out equal foreign and domestic asset transactions in opposite directions to nullify the impact of their foreign exchange operations on the domestic money supply
- the central bank can negate the money supply effect of intervention through sterilisation; with no sterilisation, there is a link between the balance of payments and national money supplies that depends on how central banks share the burden of financing payments gaps
- if central banks are not sterilising and the home country has a balance of payments surplus, for example, any associated increase in the home central bank's foreign assets implies an increased home money supply; similarly, any associated decrease in a foreign central bank's claims on the home country implies a decreased foreign money supply

### 3. How the Central Bank Fixes the Exchange Rate

-to hold the exchange rate constant, the central bank must be willing to trade currencies at the fixed exchange rate with the private actors in the foreign exchange market; the central bank can succeed in holding the exchange rate fixed only if its financial transactions ensure that asset markets remain in equilibrium when the exchange rate is at its fixed level

-a central bank can fix the exchange rate of its currency against foreign currency if it is willing to trade unlimited amounts of domestic money against foreign assets at that rate—to fix the exchange rate, the central bank must intervene in the foreign exchange market whenever this is necessary to prevent the emergence of an excess demand or supply of domestic currency assets—in effect, the central bank adjusts its foreign assets—and domestic money supply—to ensure that asset markets are always in equilibrium under the fixed exchange rate

-a commitment to fix an exchange rate forces the central bank to sacrifice its ability to use monetary policy for stabilisation; a purchase of domestic assets by the central bank causes an equal fall in its official international reserves, leaving the money supply and output unchanged; similarly, a sale of domestic assets by the bank causes foreign reserves to rise by the same amount but has no other effects

-to hold the exchange rate fixed when output rises, the central bank must purchase foreign assets and thereby raise the money supply

### 4. Stabilisation Policies with a Fixed Exchange Rate

-stabilisation policies have different effects when the exchange rate is fixed; by fixing the exchange rate, the central bank gives up its ability to influence the economy through monetary policy—fiscal policy, however, becomes a more potent tool for affecting output and employment

-fiscal policy, unlike monetary policy, has a more powerful effect on output under fixed exchange rates than under floating rates—under a fixed exchange rate, fiscal expansion does not, in the short run, cause a real appreciation that crowds out aggregate demand; instead, it forces central bank purchases of foreign assets and an expansion of the money supply—devaluation also raises aggregate demand and the money supply in the short run (revaluation has opposite effects)

-in the long run, fiscal expansion causes a real appreciation, an increase in the money supply, and a rise in the home price level—while devaluation causes the long run levels of the money supply and prices to rise in proportion to the exchange rate change

-under a fixed exchange rate, central bank monetary policy tools are powerless to affect the economy's money supply or its output

-when the currency is devalued, the economy's equilibrium exchange rate and output increase, and the money supply expands; could also revalue the currency

#### **3 Main Reasons Governments Devalue Their Currencies**

1. to fight domestic unemployment despite the lack of effective monetary policy
2. improvement in the CA
3. effect on central bank's foreign reserves; 1 time devaluation can increase reserves

-if fiscal and exchange rate changes occur when there is full employment and the policy changes are maintained indefinitely, they will ultimately cause the domestic price level to move in such a way that full employment is restored

-the adjustment to a devaluation is similar—in fact, since a devaluation does not change long-run demand or supply conditions in the output market, the increase in the long-run price level caused by a devaluation is proportional to the increase in the exchange rate—a devaluation under a fixed exchange rate has the same long-run effect as a proportional increase in the money supply under a floating exchange rate—like the latter policy, devaluation is neutral in the long run, in the sense that its only effect on the economy's long-run equilibrium is a proportional rise in all nominal prices and in the domestic money supply

### 5. Balance of Payment Crises and Capital Flight

-fixed exchange rates can still experience devaluations due to domestic motives or international pressure

**\*balance of payments crises-** a sharp change in official foreign reserves by a change in expectations in about the future exchange rate

-the expectation of a future devaluation causes a balance of payments crisis marked by a sharp fall in reserves and a rise in the home interest rate above the world interest rate—similarly, an expected revaluation causes an abrupt rise in foreign reserves together with a fall in the home interest rate below the world rate

**\*capital flight-** reserve loss accompanying a devaluation scare; residents flee the domestic currency by selling it to the central bank for foreign exchange and they then invest the proceeds abroad

-to hold the interest rate fixed after the market decides it will be devalued, the central bank must use its reserves finance a private financial outflow that shrinks the money supply and raises the home interest rate

-balance of payments crises occur when market participants expect the central bank to change the exchange rate from its current level; if the market decides a devaluation is coming, for example, the domestic interest rate rises above the world interest rate and foreign reserves drop sharply as private capital flows abroad; self-fulfilling currency crises can occur when an economy is vulnerable to speculation—in other circumstances an exchange rate collapse may be the inevitable result of inconsistent government policies

-self-fulfilling currency crises can occur when expectations about devaluations occur and are realised

### 6. Managed Floating and Sterilised Intervention

-under managed floating, monetary policy is influenced by exchange rate changes without being completely subordinate to the requirements of a fixed rate; instead, the central bank faces tradeoffs between domestic objectives such as employment and inflation and exchange rate stability

-central banks usually use sterilised policies to reduce the effect on the money supply

**\*perfect asset suitability-** the foreign exchange market is in equilibrium only when the expected returns on domestic and foreign currency bonds are the same; the exchange rate is therefore determined so that the interest parity condition holds—in this case, there is

nothing the central bank can do through foreign exchange intervention that it couldn't do as well through purely domestic open-market operations

**\*imperfect asset suitability**- when it is possible for asset's expected returns to differ in equilibrium—main factor that leads to this is risk premium, for example in bonds and stocks; central banks can alter the riskiness of domestic currency assets to move the exchange rate even when the money supply doesn't change

-under perfect suitability only return matters, under imperfect suitability risk and return matter

-a sterilised purchase of foreign assets leaves the money supply unchanged but raises the risk-adjusted return that domestic currency deposits must offer in equilibrium—as a result, the return curve in the upper panel shifts up and to the right, which depreciates the currency other things equal

**\*signalling effect of foreign exchange intervention**- when market participants are unsure of the future direction of macroeconomic policies, sterilised intervention may give an indication of where the central bank expects or desires the exchange rate to move; most effective when the government is unhappy with the exchange rate's level and declares in public and then uses sterilisation policy—crying wolf, doesn't work in long run

-a system of managed floating allows the central bank to retain some ability to control the domestic money supply, but at the cost of greater exchange rate instability; if domestic and foreign bonds are imperfect substitutes, however, the central bank may be able to control both the money supply and the exchange rate through sterilised foreign exchange intervention—empirical evidence shows little support for the idea that sterilised intervention has a significant direct effect on exchange rates—even when domestic and foreign bonds are perfect substitutes, so that there is no risk premium, sterilised intervention may operate indirectly through a signalling effect that changes market views of future policies

## 7. Reserve Currencies in the World Money Supply

-both reserve currency standards and the gold standard result in fixed exchange rates between all pairs of currencies in the world—but the 2 systems have very different implications about how countries share the burden of balance of payments financing and about the growth and control of national money supplies

### 2 Fixed Rate Systems

**1. reserve currency**- countries use 1 currency as the world reserve

-central banks therefore hold a large portion of their international reserves in the form of US Treasury bills and short-term dollar deposits, which pay interest and can be turned into cash at relatively low cost

-even though each central bank ties its currency exchange rate to the dollar, market forces automatically held all other exchange rates—cross rates—constant at the values implied by the dollar rates—thus the post WWII exchange rate system was one in which exchange rates between any 2 currencies were fixed

**2. gold standard**- pegged to gold

-a world system of fixed exchange rates in which countries peg the prices of their currencies in terms of a reserve currency involves a striking asymmetry; the reserve

currency country, which does not have to fix any exchange rate, can influence economic activity both at home and abroad through its monetary policy; in contrast, all other countries are unable to influence their output or foreign output through monetary policy; this policy asymmetry reflects the fact that the reserve centre bears none of the burden of financing its balance of payments but the other countries have to accept the monetary policy of the reserve country as their own

### **8. The Gold Standard**

-a gold standard in which all countries fix their currencies' prices in terms of gold, avoids symmetry inherent in a reserve currency standard and also places constraints on the growth of countries' money supplies (bimetallic with gold and silver works also); the gold standard has serious drawbacks that make it impractical as a way of organising today's international monetary system; even the dollar-based gold exchange standard set up after WWII ultimately proved unworkable

-symmetric foreign reserves changes unlike reserve currency which as asymmetric foreign reserves changes

#### ***Drawbacks***

1. constraints on monetary policy to fight unemployment
2. change's in gold's relative price can change basket prices
3. hard to increase money supply
4. countries with more gold reserves would prosper

**\*gold exchange standard-** halfway between gold standard and reserve currency; reserves consist of gold and reserve currency that is fixed to gold

-an increase in the supply of domestic currency bonds that the private sector must hold raises the risk premium on domestic currency assets

-a currency crises is often not the result of arbitrary shifts in market sentiment—instead, an exchange rate collapse can be the inevitable result of government policies inconsistent with maintaining a fixed exchange rate permanently

-the exact date on which a balance of payments crisis forces the authorities off the fixed exchange rate, as the crisis must occur at some point because profligate monetary policies make one inevitable

# IV. International Macroeconomic Policy

## The International Monetary System, 1870-1973

### 1. Macroeconomic Policy Goals in an Open Economy

-the international monetary system has direct consequences on individual country's macroeconomic policies and results

-countries have 2 basic macroeconomic goals in an open economy: internal balance (full employment with price stability) and external balance (avoiding excessive imbalances in international payments); external balance illustrates well the interactions in the world

-internal and external balance do not capture all the policy concerns, but most of them

-external balance is more difficult than internal balance because there are no natural benchmarks like full employment or stable prices

-countries with fixed exchange rates will adopt different external balance goals than those with floating rates—the CA balance is of primary concern

-a CA deficit may lead to payment issues abroad, and CA surpluses may lead to protectionist policies; try to avoid too large a deficit or surplus

-external balance under a gold standard consisted of not gaining gold from abroad nor (more important) losing gold to foreigners

**\*balance of payments equilibrium-** when the sum of its current, capital, and nonreserve financial accounts equals 0, so that the current plus capital account balance is financed entirely by private international lending without reserve requirements; this prevented large gold movements via shipping, as this was a cumbersome process

**\*price-specie-flow mechanism-** prices rise and fall in accordance with the amount of gold in the economy; one of the powerful automatic mechanisms that contribute to the simultaneous achievement of balance of payments equilibrium by all countries

-the rule of the game with regard to the gold standard is: differences in international inflows and outflows not financed by loans from the creditor nation must be financed by gold from the debtor nation—the changes in gold flows increase and decrease money supplies thereby increasing and decreasing prices accordingly appreciating and depreciating the currencies and raising and decreasing the CA

-in theory the price-specie flow mechanism could operate automatically, but in reality central banks take action when too much gold is flowing out, they would rather sell domestic assets to prevent nonpayment of gold notes—pushing domestic interest rates up



and attracting foreign capital—conversely, banks accumulating gold could get better returns with interest bearing assets, so they may purchase assets driving down interest rates

**\*gold standard rules of the game-** buying assets with a surplus and selling assets with a deficit—speeds the movement of all countries toward their external balance goals, thereby increasing the efficiency of the automatic alignment processes inherent in the gold standard

-research has shown that the rules of the game applied with greater force to deficit than surplus countries, and so deficit countries commonly had to bring to payments into balance for all countries

-by not always taking actions to reduce gold inflows, the surplus countries worsened a problem of international policy coordination inherent in the system: deficit countries competing for a limited supply of gold reserves might adopt overcontractionary monetary policies that harmed employment while doing little to improve their reserve positions

-however, governments sometimes ignore the rules of the game and the effect their actions have on their countries; countries even sometimes sterilised gold flows, selling domestic assets when foreign reserves were rising and buying domestic assets as foreign reserves fall—governments also interfere with the private gold exports

-in an open economy, policymakers try to maintain internal balance (full employment and a stable price level) and external balance (current account level that is neither so negative so the country may be insolvent or so positive so foreign countries are in that position)

-the definition of external balance depends on a number of factors, including the exchange rate regime and world economic conditions—because each country's macroeconomic policies have repercussions abroad, a country's ability to reach internal and external balance depends on the policies other countries choose to adopt

## **2. Interwar Years: 1918-1939**

-the gold standard contains a powerful automatic mechanism for assuring external balance, the price-specie-flow mechanism; the flows of gold accompanying deficits and surpluses cause price changes that reduce current account imbalances and therefore tend to return all countries to external balance; the system's performance in maintaining internal balance was mixed; with the eruption of WWI in 1914, the gold standard was suspended

-attempts to return to the prewar gold standard after 1918 were unsuccessful—as the world economy moved into general depression after 1929, the restored gold standard fell apart and international economic integration weakened; in the turbulent economic conditions of the period, governments made internal balance their main concern and tried to avoid the external balance problem by partially shutting their economies off from the rest of the world; the result was a world economy in which all countries' situations could have been bettered through international cooperation

## **3. Bretton Woods System and the International Monetary Fund**

-the architects of the IMF hoped to design a fixed exchange rate system that encourage growth in international trade while making the requirements of external balance sufficiently flexible that they could be met without sacrificing internal balance; to this end, the IMF charter provided financing facilities for deficit countries and allowed

exchange rate adjustments in conditions of fundamental disequilibrium—all countries pegged their currencies to the dollar; the US pegged to gold and agreed to exchange gold for dollars with foreign central banks at a price of \$35 per ounce

## **2 Characteristics of the IMF**

1. all members contributed gold and their currencies to lend to countries in need
2. although exchange rates against the dollar were fixed, these could be adjusted with agreement of the IMF—fundamental disequilibrium

-the IMF demanded that all countries make their currencies convertible, otherwise international trade becomes very difficult—US and Canada in 1945, Europe in 1958, and Japan in 1964

-as the US was the backer of the gold and the most convertible currency, it became the most valuable currency—this increasing convertibility meant that countries domestic policies and economic conditions became closer linked, and countries therefore had to pay close attention to foreign economic and political climates—led to the creation of the worldwide foreign exchange market

-improved financial integration, but disguised capital flows were still available; home importers could effectively purchase foreign assets by accelerating payments to foreigners (leads) , and could borrow from foreign suppliers by delaying payments (lags)

-meant international interest rate equality was not yet reached

-this new system led the IMF to suggest devaluations for currencies with large CA deficits and revaluations for currencies with large CA surpluses for being in fundamental disequilibrium

-Britain, France, and Germany had speculative attacks on their currencies in 1960s that led to them being devalued and ultimately the collapse of the Bretton Woods System (balance of payments crises)

## **4. Analysing Policy Options Under the Bretton Woods System**

-acting alone, fiscal policy can either attain internal or external balance, but only at the cost of increasing the economy's distance from the goal that is sacrificed

**\*expenditure-changing policy-** alters the level of the economy's total demand for goods and services

**\*expenditure-switching policy-** accompanying exchange rate adjustment—changes the direction of demand, shifting it between domestic output and imports

-both are needed to reach internal and external balance

-under the Bretton Woods rules, exchange rates changes (expenditure-switching) were supposed to be infrequent—this left fiscal policy as the main tool for moving the economy toward internal and external balance

-but relying only on fiscal policy is not logical or practical, and exchange-rate changes tend to last longer anyways; countries began experiencing CA crises and external balance problems were they were being affected by the outside world and shut their economies off and the Bretton Woods System broke down

-after currency convertibility was restored in Europe in 1958, countries' financial markets became more closely integrated, monetary policy became less effective (except for US), and movements in international reserves became more volatile; these changes revealed a

key weakness in the system—to reach internal and external balance at the same time, expenditure-switching as well as expenditure-changing policies were needed  
 -but the possibility of expenditure-switching policies (exchange rate changes) could give rise to speculative financial flows that undermined fixed exchange rates; as the main reserve currency country, the US faced a unique external balance problem: the confidence problem that would arise as foreign official dollar holdings inevitably grew to exceed US gold holdings

### **5. External Balance Problem of the US**

-the US was in a different position from the rest of the world, it did not have to peg currencies to its, just maintain gold at \$35 per ounce and guarantee that foreign banks could convert their notes for gold so therefore hold sufficient reserves  
 -this created an external constraint for the US, as the supply of gold did not keep up with world growth—but US dollars paid more interest than gold, so as long as countries were willing to forgo their gold redemption for dollars all was good  
 -led to the confidence problem where by as notes outnumbered dollars, countries would realise that they could not redeem their gold notes for gold—an answer was to raise the price of gold, but this would enrich the gold producing countries and would be inflationary, and would signal that it could happen again in the future, thereby worsening the confidence problem  
 -US macroeconomic policies in the late 1960s helped cause the breakdown of the Bretton Woods system by early 1973; overexpansionary US fiscal policy contributed to the need for a devaluation of the dollar in the early 1970s, and fears that this would occur touched off speculative capital flows out of dollars that caused foreign money supplies to balloon; higher US money growth fuelled inflation at home and abroad, making foreign governments increasingly reluctant to continue importing US inflation through fixed exchange rates; a series of international crises led in stages to the abandonment in March 1873 of both the dollar's link to gold and fixed dollar exchange rates for the industrialised countries

### **6. Worldwide Inflation and the Transition to Floating Rates**

-much blame can be placed on US macroeconomic policies, because as US inflation rose foreign countries were forced to import US inflation through buying more reserve currency as the US expanded their money supply to maintain their exchange rates and expand their money supply in the process  
 -one way to avoid the imported inflation is to revalue the currency—a revaluation restores internal and external balance immediately, without domestic inflation, by using the nominal-exchange rate to offset the effect of a rise in  $P$  on the real exchange rate—only an expenditure-switching policy is needed to respond to a pure increase in foreign prices  
 -if the money supply does not increase, the prices will rise and foreign exchange by the central bank is needed, thereby expanding the money supply  
 -other domestic factors for European countries also contributed to their inflation

***2 Reasons for Bretton Woods Collapse***

1. US stop pursuing international policies after mid 1960s for domestic ones, leading to foreign countries to have to import inflation
2. discrete exchange rate adjustment inspired speculative attacks that made both internal balance and external balance more difficult to achieve

## Macroeconomic Policy and Coordination Under Floating Exchange Rates

### 1. Case for Floating Exchange Rates

-the weaknesses of the Bretton Woods System led many economists to advocate floating exchange rates before 1973, however there are also issues with floating rate systems

### *3 Arguments for Floating Rates*

#### 1. monetary policy autonomy

-floating rates give national macroeconomic policy makers greater autonomy in managing their economies, Europe isn't dependent on the US  
 -if central banks were no longer obliged to intervene in currency markets to fix exchange rates, governments would be able to use monetary policy to reach internal and external balance—no country would be forced to import inflation or deflation from abroad  
 -avoids revaluation crises—the mechanism behind this theory is PPP

#### 2. symmetry

-floating rates would remove the asymmetries of the Bretton Woods arrangements  
 -under a system of floating rates the inherent asymmetries of Bretton Woods would disappear and the US would no longer be able to set world monetary conditions all by itself—at the same time, the US would have the same opportunity as other countries to influence its exchange rate against foreign currencies

\*2 main asymmetries- Fed had more authority than other central banks, the US couldn't devalue like other countries could

#### 3. exchange rates as automatic stabilisers

-floating exchange rates will quickly eliminate the fundamental disequilibria that had led to parity changes and speculative attacks under fixed rates  
 -even in the absence of an active monetary policy, the swift adjustment of market-determined exchange rates would help countries maintain internal and external balance in the face of changes of AD; the long and agonizing periods of speculation preceding exchange rate realignments under the Bretton Woods rules would not occur under floating

### 2. Case Against Floating Exchange Rates

-there were arguments against floating rates as well

### *5 Arguments Against Floating Rates*

#### 1. discipline

-central banks freed from the obligation to fix their exchange rates might embark on inflationary policies—in other words, the discipline imposed on individual countries by a fixed rate would be lost

#### 2. destabilising speculation and money market disturbances

-speculation on changes in exchange rates could lead to instability in foreign exchange markets, and this instability, in turn, might have negative effects on countries' internal and external balances—further, disturbances to the home money market could be more disruptive under floating than under a fixed rate

### **3. injury to international trade and investment**

-floating rates would make relative international prices more unpredictable and thus injure international trade and investment

### **4. uncoordinated economic policies**

-if the Bretton Woods rules on exchange rate adjustment were abandoned, the door would be opened to competitive currency practices harmful to the world economy—as happened during the interwar years, countries might adopt policies without considering their possible beggar-thy-neighbour aspects—all countries would suffer as a result

### **5. illusion of greater autonomy**

-floating exchange rates would not really give countries more policy autonomy—changes in exchange rates would have such pervasive macroeconomic effects that central banks would feel compelled to intervene heavily in foreign exchange markets even without a formal commitment to peg—thus floating would increase the uncertainty in the economy without really giving macroeconomic policy greater freedom

-the exchange rate is actually so valuable to macroeconomic policy making that it would still have to be considered

## ***2 Causes of Stagflation***

-a combination of stagnating output and high inflation

1. increases in commodity prices that directly raised inflation while at the same time depressing AD and AS

2. expectations of future inflation that fed into wages and other prices in spite of recession and rising unemployment

-2 oil shocks and weak dollar in the 1970s

## **3. Macroeconomic Interdependence Under a Floating Rate**

-between 2 large countries

### ***2 Effects***

1. effect of a permanent monetary expansion by home—home output rises, home's currency depreciates, and foreign output may rise or fall

2. effects of a permanent fiscal expansion by home—home output rises, home's currency appreciates, and foreign output rises

-many disinflations, crises, and global imbalances from 1980-2008

## **4. What Has Been Learned Since 1973?**

-between 1973 and 1980 floating rates seemed on the whole to function well; in particular, it is unlikely that the industrialised countries could have maintained fixed exchange rates in the face of stagflation caused by 2 oil shocks; the dollar suffered a sharp depreciation after 1976, however, as the US adopted macroeconomic policies more expansionary than those of other industrial countries

### ***3 Arguments for Floating Rates***

#### **1. monetary policy autonomy**

-PPP has not held and higher inflation has been associated with greater currency depreciation—inflation insulation is broadly supported in the long run, but critics are right that floating rates have not completely insulated economies from foreign policy shocks

#### **2. symmetry**

-countries still hold foreign currencies to intervene in markets, so symmetry is not present—pound and yen gained importance as foreign reserves

#### **3. exchange rate as an automatic stabiliser**

-floating rates did allow countries to react better to oil shocks and economic transitions—but floating rates did not completely eliminate inflation issues

### ***5 Arguments Against Floating Rates***

#### **1. discipline**

-there was not a distinct lack of discipline from central banks to pursue inflationary policies

#### **2. destabilising speculation**

-has been short term fluctuations, but long term the rates have tended to move with monetary and fiscal policies—some still argue that more systematic foreign exchange rate intervention is needed

#### **3. international trade and investment**

-international trade has grown, but some argue that the costs of avoiding exchange rate risk has actually dampened the growth rate of international trade

-protectionism and resulting misalignment can hamper international trade

#### **4. policy coordination**

-floating exchange rates have not encouraged policy coordination; governments still innately will follow their own interests

-a sharp turn toward slower monetary growth in the US, coupled with a rising US government budget deficit, contributed to massive dollar appreciation between 1980 and early 1985; other industrial economies pursued disinflation along with the US, and the resulting worldwide monetary slowdown, coming soon after the second oil shock, led to the deepest recession since the 1930s; as the recovery from the recession slowed in late 1984 and the US current account began to register record deficits, political pressure for wide-ranging trade restrictions gathered momentum in Washington; the drive for protection was slowed (but not defeated) by the September 1985 decision of the US and 4 other major industrial countries to take concerted action to bring down the dollar; exchange rate stability was downplayed as a prime policy goal in the 1990s and 2000s; instead, governments aimed to target low domestic inflation while maintaining economic growth; after 2000 global external imbalances widened dramatically

### **5. Are Fixed Exchange Rates Even an Option for Most Countries**

-in a financially integrated world in which funds can move instantly between national financial markets, fixed exchange rates cannot be credibly maintained over the long run unless countries are willing to maintain controls over capital movements (China) or if they move to a shared single currency with their monetary partners (Europe)

- thus attempts to fix exchange rates will be met with scepticism
- additionally, speculative attacks on currency can be self-fulfilling crises, as happens with relative frequency
- the experience of floating does not fully support either the early advocates of that exchange rate system or its critics; 1 unambiguous lesson of experience, however, is that no exchange rate system functions well when international economic cooperation breaks down; severe limits on exchange rate flexibility among the major currencies are unlikely to be reinstated in the near future—but increased consultation among international policy makers should improve the performance of floating rates

## **6. Directions for Reform**

- neither system is fully correct, but both work best with unilateral cooperation from all participating parties—all countries of the world
  - suggestions range from target zones for currencies, fixed rates, to a single world currency
  - but because countries are unwilling to give up the autonomy the floating rates gives them, none of these will work soon
  - cooperation is seen in the GATT, WTO, IMF, and the World Bank
- international policy coordination failures are real, and all the countries must work together to achieve better results



## Optimum Currency Areas and European Experience

### 1. How the European Single Currency Evolved

-11 members to start, now at 15; required giving up more autonomy than a traditional fixed rate system—they lost their individual currencies, and handed control of monetary policies to the ESCB

### 2 *Reasons EU Countries For Favouring Mutually Fixed Exchange Rates*

#### 1. to enhance Europe's role in the world monetary system

-monetary cooperation will lead to heavier weight in international economic negotiations, especially at a self-absorbed US

#### 2. to turn the EU into a truly unified market

-fixed exchange rates are a complement to EU initiatives aimed at building a common European market—1957 Treaty of Rome began the process, but they wanted truly free borders

-the European Monetary System of fixed intra-EU exchange rates was inaugurated in March 1979 and originally included Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, and the Netherlands; Austria, Britain, Portugal, and Spain joined much later; capital controls and frequent realignments were essential ingredients in maintaining the system until the mid 1980s, but since then controls have been abolished as part of the EU's wider 1992 program of market unification; during the currency crises that broke out in September 1992, Britain and Italy allowed their currencies to float—in August 1993 most currency bands were widened to  $\pm 15\%$  in the face of continuing speculative attacks

### 4 *Steps of EU History*

#### 1. European Monetary System EMS 1979-1998

-restricted member's currencies to fluctuation limits between 8 members— $2.35-15\%$

-easy credit between member central banks

-capital controls that limited domestic resident's sale of domestic currency

-controls relaxed into the 1990s with no issues, but when Germany reunited they boomed, the German bank raised interest rates to control inflation, and the other countries started to follow suit and suffered

#### 2. German Monetary Dominance and Credibility Theory of EMS

-other countries imported Germany's low inflation; devaluing currency leads to current economic boom but long term inflation

#### 3. EU 1992 Initiative

-further broke down remaining trade barriers in EU

#### 4. European Economic and Monetary Union

-different currency arrangements leave different room for individual monetary policy; the EMU was formed on 1991 in Maastricht (Treaty) when they all agreed to move from one end of the spectrum (individual monetary policy) to the other end (single currency)

### 4 *Advantages of EMU over EU*

1. better for unification than fixed exchange rates

2. give the ESCB control instead of Germany
3. better for trade
4. political stability of Europe—no more WW—peace on the continent

-in practice, all EMS currencies were pegged to Germany's former currency, the DM; as a result Germany was able to set monetary policy for the EMS; just as the US did in the Bretton Woods System

**\*credibility theory of the EMS-** holds that participating governments profited from the German Bundesbank's reputation as an inflation fighter; in fact, inflation rates in the EMS countries tended to converge around Germany's generally low inflation rate

## **2. The Euro and Economic Policy in the Euro Zone**

-on January 1, 1999, 11 EU countries initiated an economic and monetary union EMU by adopting a common currency, euro, issued by a European System of Central Banks ESCB; ESCB consists of EU members' national central banks and a European Central Bank, in Frankfurt, whose governing council runs monetary policy in EMU; the transition process from the EMS fixed exchange rate system to EMU was spelled out in the Maastricht Treaty, signed by European leaders in December 1991

### ***4 Criteria for Admittance to EMU***

1. country's inflation rate in the year before admission must be no more than 1.5% above the average rate of inflation of the 3 EU member states with lowest inflation
2. country must have maintained a stable exchange rate within the ERM without devaluing on its own initiative
3. country must have a public-sector deficit no higher than 3% of its GDP (except in exceptional and temporary circumstances)
4. country must have a public debt that is below or approaching a reference level of 60% of its GDP

-treaty provides for ongoing monitoring of 3 and 4; penalties can be levied after admission, and national governments lose some of their policy autonomy in that they can not use fiscal policy for issue fighting

**\*stability and growth pact SGP-** sets out medium term budgetary objective of positions close to balance or in surplus; sets out a timetable for the imposition of financial penalties on countries that fail to correct situations of excessive deficits and debt promptly enough—tightens fiscal restraints further, not been tightly enforced

-Germany initially wanted the convergence criteria, fear of high public debts, and SGP in that they didn't want member countries pursuing irresponsible fiscal policies to weaken the euro—Germany and France were first countries penalised under the new rules

-the ESCB is located in Frankfurt, the 15 central banks play a role analogous to the Fed district banks

-the ESCB has the most political insulation from any other central bank; the only way to change it is an amendment to the Maastricht treaty, which would require voting from all 15 member EMU countries

-EU countries not in EMU can peg their currency to the euro within 15% and then under ERM 2 rules they have more room for asymmetry for the non EMU countries to adjust passively to the euro based on interest rates and domestic issues

-the Maastricht Treaty specified a set of macroeconomic convergence criteria that EU countries would need to satisfy to qualify for admission to the EMU; a major purpose of the convergence criteria was to reassure voters in low-inflation countries such as Germany that the new jointly managed European currency would be as resistant to inflation as the DM had been; a Stability and Growth Pact SGP, devised by EU leaders in 1997 at Germany's insistence, may restrict the flexibility of EMU members to carry out fiscal policy at the national level; the SGP and EMU together could therefore deprive individual countries in the euro zone of national fiscal as well as monetary policy, but the SGP has not been enforced in practice, and weakened in 2005

### 3. Theory of Optimum Currency Areas

-EMU has helped political goals, but its future survival depends on achieving economic goals better

**\*theory of optimum currency areas-** implies that all countries will wish to join fixed exchange rate areas closely linked to their own economies through trade and factor mobility; fixed exchange rates are most appropriate for areas closely integrated through international trade and factor movements—costs and benefits depend on how integrated the economy is with its potential partners

**\*monetary efficiency gain-** the joiner's saving from avoiding the uncertainty, confusion, and calculation and transaction costs that arise when exchange rates float

-a high degree of economic integration between a country and a fixed exchange rate area magnifies the monetary efficiency gain the country reaps when it fixes its exchange rate against the area's currencies

**\*economic stability loss-** costs arising from the country giving up its ability to use the exchange rate and monetary policy for the purpose of stabilising output and employment

-a high degree of economic integration between a country and the fixed exchange rate area that it joins reduces the resulting economic stability loss due to output market disturbances

-a country's decision to join an exchange rate area is determined by the difference between the monetary efficiency gain from joining and the economic stability loss from joining; the GG-LL diagram relates both of these factors to the degree of economic integration between the joining country and the larger fixed exchange rate zone; only when economic integration passes a critical level is it beneficial to join

-optimum currency areas are groups of regions with economies closely linked by trade in goods and services and by factor mobility—fixed exchange rate area best serves the economic interests when the degree of output and factor trade among the included economies is high

### 4. Future of EMU

-the EU does not appear to satisfy all the criteria for an optimum currency area; although 1992 removed many barriers to market integration within the EU and the euro appears to have promoted intra-EU trade, its level still is not very extensive

-in addition, labour mobility between and even within EU countries appears more limited than within other large currency areas, such as the US; finally, the level of fiscal federalism in the EU is too small to cushion member countries from adverse economic events

***Issues***

1. Europe is not an optimum currency area
2. single currency project has taken economic union far beyond political union
3. labour mobility not good, especially in large countries
4. constraints on national fiscal policy due to SGP could be especially painful due to the absence of substantial fiscal federalism within the EU
5. EU is expanding

## The Global Capital Market: Performance and Policy Problems

### 1. International Capital Market and the Gains from Trade

-international capital market is the market in which residents of different countries trade assets—group of closely connected markets in which asset exchanges with some international dimension takes place

-international currency trades take place in the FOREX market, which is an important part of the international capital market

-main actors are the same as the FOREX market: commercial banks, large corporations, nonbank financial institutions, central banks, and other government agencies

-like FOREX takes place in a network of world financial centres linked by sophisticated communications systems

-unlike FOREX, countries' stocks and bonds in addition to banks deposits denominated in their currency are traded

-international trade of goods and services has gains due to lower transaction costs from worldwide payments systems—banks have increased gains from this type of trade through these systems

-also gains from trade arising from asset trades as well (stocks and bonds)—more than speculation

#### *3 Types of Trade*

1. goods or services for goods or services
2. goods or services for assets
3. assets for assets

#### *3 Gains from Trade*

1. basic—goods or services for goods or services
2. intertemporal—goods or services for future claims (assets)
3. asset swapping

-when people are risk averse, countries can gain through the exchange of risky assets; the gains from trade take the form of a reduction in the riskiness of each country's consumption; international portfolio diversification can be carried out through the exchange of debt instruments or equity instruments

-portfolio diversification increases gains from trade by reducing riskiness in both debt and equity assets (instruments)

### 2. International Banking and the International Capital Market

-the international capital market is the market where residents of different countries trade assets; one of its important components is the foreign exchange market; banks are at the

centre of the international capital market, and many operate offshore, outside the countries where their head offices are based

### ***Structure of International Capital Market***

1. commercial banks
2. corporations
3. nonbank financial institutions
4. central banks and other government agencies

-countries have progressively dismantled barriers to private capital flows across their borders—which has operates with the particular exchange rate systems

### **Trilemma**

-with fixed rate systems, only 2 of these 3 are possible at the same time

1. fixed exchange rate
2. monetary policy oriented toward domestic goals
3. freedom of international capital movements

-floating rates allows 2 and 3

**\*offshore banking-** business that banks' conduct destined for foreign business

### ***3 Types of Offshore Institutions***

1. agency office- doesn't accept deposits
2. subsidiary- RCB Centura
3. foreign branch- RCB

-offshore currency trading is done with Eurocurrencies—deposits of any domestic currencies held abroad—much of this is used for offshore currency trading—then for assets and international business transactions

-eurodollars are dollar deposits

-regulatory and political factors have encouraged offshore banking; the same factors have encouraged offshore currency trading, trade in bank deposits denominated in currencies of countries other than the one in which the bank is located; such Eurocurrency trading has received a major stimulus from the absence of reserve requirements on deposits in Eurobanks

-creation of a Eurocurrency deposit does not occur because that currency leaves its country of origin; all that is required is that a Eurobank accept a deposit liability denominated in the currency; Eurocurrencies therefore pose no threat for central banks' control over their domestic monetary bases; fears that Eurodollars will some day come flooding into the US are misguided

-regulatory asymmetries explain why some cities have evolved as centres of Eurocurrency trading; there are usually more stringent regulations for domestic deposits to insulate the domestic economy, but regulations for foreign deposits can vary widely

### **3. Regulating International Banking**

-the largely unregulated nature of global banking activity leaves the world financial system vulnerable to bank failure on a massive scale

-banks security relies primarily on confidence, bank failures can reverberate quickly to other banks—as such, extensive regulation is used for banking

### ***5 Main US Safeguards***

1. deposit insurance
2. reserve requirements
3. capital requirements and asset restrictions
4. bank examination
5. lender of last resort facilities

### ***5 Difficulties in Regulating International Banking***

1. no deposit insurance
2. no reserve requirements
3. bank examination more difficult
4. asset restrictions more difficult
5. lender of last resort?

-offshore banking is largely unprotected by the safeguards national governments have imposed to prevent domestic bank failures; in addition, the opportunity banks have to shift operations offshore has undermined the effectiveness of national bank supervision; since 1974, the Basel Committee of industrial country bank supervisors has worked to enhance regulatory cooperation in the international area; that group's 1975 Concordant allocated national responsibility for monitoring banking institutions and provided for information exchange—there is still uncertainty about a central bank's obligations as an international lender of last resort

-that uncertainty may reflect an attempt by international authorities to reduce moral hazard; the trend toward securitisation has increased the need for international cooperation in monitoring and regulating nonbank financial institutions

-emerging markets and increasing securitisation have made regulation even more difficult  
-LTCM and US mortgage market are 2 examples of near global meltdowns

### **4. How Well Has the International Capital Market Performed?**

-the present structure of the international capital market involves risks of financial instability that can be reduced only through the close cooperation of bank supervisors in many countries—but the same profit motive that leads multinational financial institutions to innovate their way around national regulations can also provide important gains for consumers—can lead to better allocation and diversification

-the international capital market has contributed to an increase in international portfolio diversification since 1970, but the extent of diversification still appears incomplete compared with what economic theory would predict; similarly, some observers have claimed that the extent of intertemporal trade, as measured by countries' current account balances, has been too small; such claims are hard to evaluate without more detailed information about the functioning of the world economy than is yet available; less ambiguous evidence comes from international interest rate comparisons, and this evidence points to a well-functioning market—rates of return on similar deposits issued in the major financial centres are quite close

-the foreign exchange market's record in communicating appropriate price signals to international traders and investors is mixed; tests based on the interest parity condition

seem to suggest that the market ignores readily available information in setting exchange rates, but since the interest parity theory ignores risk aversion and the resulting risk premiums, it may be an oversimplification of reality; attempts to model risk factors empirically have not been very successful—tests of excessive exchange rate volatility also yield a mixed verdict on the foreign exchange market's performance



## Developing Countries: Growth, Crisis, and Reform

### 1. Income, Wealth, and Growth in the World Economy

- trade and borrowing has increased between developing and developed countries; fine line between those countries whose standard of living is increasing and between those whose is dropping
- poverty is the basic problem of developing countries and escaping from poverty is their overriding economic and political challenge
- most developing countries are also poor in the factors of production: skilled labour and capital—this contributes to low per-capita income and hard to achieve economies of scale
- factor scarcity can be a symptom of larger problems: political instability, insecure property rights, misguided economic policies

### *4 Main Groups of World's Economies???????????*

1. low income—Pakistan, India, Africa
  2. lower middle income—China, mid east, Latin America, Soviet counties, Africas
  3. upper middle income—Saudi Arabia, Poland, South Africa
  4. high income—western, Israel, Asian Tigers, Kuwait
- 4<sup>th</sup> group is much more advanced GDP wise than the other 3 groups

-there are vast differences in per-capita income and in well-being between countries at different stages of economic development; furthermore, developing countries have not shown a uniform tendency of convergence to the income levels of industrial countries; some developing countries, however, notably several in East Asia, have seen dramatic increases in living standards since the 1960s; explaining why some countries remain poor and which policies can promote economic growth remains one of the most important challenges in economics

### 2. Structural Features of Developing Countries

-developing countries form a heterogeneous group, especially since many have embarked on wide-ranging economic reform in recent years

#### *Features of Developing Countries*

1. heavy government involvement in the economy, including a large share of public spending in GDP
2. a track record of high inflation—governments usually use seigniorage in the face of ineffective tax collection
3. weak credit institutions and undeveloped capital markets
4. pegged exchange rates and exchange or capital controls, including crawling peg exchange rates regimes aimed at either controlling inflation or preventing real appreciation
5. heavy reliance on primary commodity exports
6. corruption and bribery are rampant

-corruption seems to increase as a country's relative poverty rises; many of these features date from the Great Depression of the 1930s and WWII afterwards, when industrialised countries turned inward and world markets collapsed and these countries were forced to develop more internally and with less help from the outside world

### **3. Developing-Country Borrowing and Debt**

-because many developing economies offer potentially rich opportunities for investment, it is natural that they have CA deficits and borrow from richer countries; in principle, developing-country borrowing can lead to gains from trade that make both borrowers and lenders better off (intertemporal trade); in practice however, borrowing by developing countries has sometimes led to default crises that generally interact with currency and banking crises

-like currency and banking crises, default crises can contain a self-fulfilling element, even though their occurrence depends on fundamental weaknesses in the borrowing country—often default crises begin with a sudden stop of financial inflows

#### ***Default Crises***

1. American states default on European loans in 19<sup>th</sup> century for canals
2. Latin America 1890, Argentina especially—Baring Crises
3. 1917 Soviets closed off Russia
4. 1930s Great Depression everyone defaulted
5. Argentina 2005—private creditors settled for 1/3 of owed monies

\***sudden stop of financial inflows**- default leads to immediate repayment of short term principal debt—this leads to a net foreign outflow, which means they have to increase their exports or decrease imports

-defaults can be self-fulfilling prophecy, like banks runs and BOP crises (pegged exchange rates)—these crisis triplets reinforce each other; the immediate origin of such pervasive economic collapse can be in the financial system (sudden stop), FOREX market, or the banking system

-sovereign default is when the government defaults, but private and government defaults often go with each other, as the government often will accept the private debt

#### ***5 Forms of Financial Inflow***

1. bond finance
  2. bank finance
  3. official lending
  4. foreign direct investment
  5. portfolio investment in ownership of firms
- debt and equity

\***original sin**- developing countries' inability to borrow in their own currency

-developed countries can borrow in their own currencies and reduce transaction costs because their currency is more stable and easier accepted

-in the 1970s as the Bretton Woods System collapsed, countries in Latin America entered an era of distinctly inferior macroeconomic performance with respect to growth and inflation; uncontrolled external borrowing led in the 1980s to a generalised developing-country debt crises, with its greatest impact in Latin America and Africa; starting with Chile in the mid 1980s, some large Latin American countries started to undertake more thorough economic reform, including not just disinflation but also control of the government budget, vigorous privatisation, deregulation, and trade policy reform  
 -Argentina adopted a currency board in 1991—not all the Latin American reformers succeeded equally in strengthening their banks, and failures were evident in a number of countries—Argentina’s currency board, for example, collapsed after 10 years

#### **4. East Asia: Success and Crisis**

-despite their astoundingly good records of high output growth and low inflation budget deficits, several key developing countries in East Asia were hit by severe panics and devastating currency depreciation in 1997; in retrospect, the affected countries had several vulnerabilities, most related to widespread moral hazard in domestic banking and finance, and linked to the original sin of foreign-currency denominated debts  
 -the effects of the crises spilled over to countries as distant as Russia and Brazil, illustrating the element of contagion in modern-day international financial crises; this factor, plus the fact that the East Asian countries had few apparent problems before their crises struck, has given rise to demands for rethinking the international finance architecture  
 -other developing countries experienced the same flight of capital; Russia had just renounced communism

#### ***Asian Weaknesses Leading to 1997 Collapse***

1. declining productivity
  2. banking regulation
  3. legal framework
- currency boards and dollarisation can help matters

#### **5. Lessons of Developing Country Crises**

-1997 crisis started with Thailand’s devaluation and crony capitalism

#### ***4 Lessons***

1. choose the right exchange rate regime
2. central importance of banking
3. proper sequence of reform measures
4. importance of contagion

#### **6. Reforming the World’s Financial Architecture**

-proposals to reform the international architecture can be grouped as preventative measures or as ex-post measures, with the latter applied once safeguards have failed to stop a crisis

***Trilemma for Open Economies***

1. independence in monetary policy
2. stability in the exchange rate
3. free movement of capital

***Preventative Measures***

1. greater transparency concerning countries' policies and financial positions
2. enhanced regulation of domestic banking
3. more extensive credit lines, private sources or IMF

***Ex-Post Measures***

1. more extensive lending by the IMF

-some observers suggest that more extensive use of capital controls, both to prevent and manage crises, but in general few countries have taken this route; in the years to come, developing countries will no doubt experiment with capital controls, dollarisation, floating exchange rates, and other regimes—the architecture that will ultimately emerge is not at all clear

**7. Understanding Global Capital Flows and the Global Distribution of Income: Is Geography Destiny?**

-recent research on the ultimate determinants of economic growth in developing countries has focused on geographical issues such as the disease environment, institutional features such as government protection of property rights, and human capital endowments—the flow of capital from rich to poor countries also depends in these factors

-while economists agree that all are important, it is less clear where policy should focus first in attempts to lift poor countries out of their poverty; for example, institutional reform might be an appropriate first step if human capital accumulation depends on the protection of property rights and personal security; on the other hand, it makes little sense to create an institutional framework for government if there is insufficient human capital to run government effectively; in that case, education should come first—the statistical obstacles to reaching unambiguous answers are formidable, so a balanced effort on all fronts is warranted

***2 Requirements of Valid Instruments***

1. influence on institutions
2. must not otherwise affect today's per-capita incomes

# Finance

**Nominal v. Real**

**I. General Finance Theory**

**II. Corporate Finance**  
**III. International Finance**  
**IV. Financial Instruments**  
**V. Financial Services**

-classes of financial instruments  
 -editing

**I. General Finance Theory**

**I. Fundamental Concepts of Financial Management**

Money and Banking  
 The Investment Environment  
 Time Value of Money  
 Asset Classes and Financial Instruments  
 How Securities are Traded  
 Mutual Funds and Other Investment Companies

**II. Portfolio Theory and Practice**

Learning about Return and Risk from the Historical Record  
 Risk Aversion and Capital Allocation to Risky Assets  
 Optimal Risky Portfolios  
 Index Models

**III. Equilibrium in Capital Markets**

The Capital Asset Pricing Model  
 Arbitrage Pricing Theory and Multifactor Models of Risk and Return  
 Efficient Market Hypothesis  
 Behavioural Finance and Technical Analysis  
 Empirical Evidence on Security Returns

**IV. Applied Portfolio Management**

Portfolio Performance Evaluation  
 International Diversification  
 Investment Policy and Framework of the CFA Institute  
 Theory of Active Portfolio Management

**II. Corporate Finance**

**I. Projects and their Valuation**

The Cost of Capital  
 The Basics of Capital Budgeting: Evaluating Cash Flows  
 Cash Flow Estimation and Risk Analysis  
 Real Options

**II. Corporate Valuation and Governance**

Financial Planning and Forecasting Financial Statements

Corporate Valuation, Value-Based Management, and Corporate Governance=

### **III. Strategic Financing Decisions**

Capital Structure Decisions

### **IV. Tactical Financing Decisions**

Initial Public Offerings, Investment Banking, and Financial Restructuring

Lease Financing

Hybrid Financing: Preferred Stock, Warrants, and Convertibles

### **V. Operational Hedging**

Working Capital Management

Derivatives and Risk Management

### **VI. Legal Manipulation**

Bankruptcy, Reorganization, and Liquidation

Mergers, LBOs, Divestitures, and Holding Companies

### **VII. Ratio Analysis**

## **III. International Finance**

### **I. International Financial Environment**

Multinational Financial Management

International Flow of Funds

International Financial Markets

Exchange Rate Determination

Currency Derivatives

### **II. Exchange Rate Behaviour**

Government Influence on Exchange Rates

International Arbitrage and Interest Rate Parity

Relationships among inflation, interest rates, and exchange rates

### **III. Exchange Rate Risk Management**

Forecasting Exchange Rates

Measuring Exposure to Exchange Rate Fluctuations

Managing Transaction Exposure

Managing Economic Exposure and Translation Exposure

### **IV. Long-Term Asset and Liability Management**

Direct Foreign Investments

Multinational Capital Budgeting

International Acquisitions

Country Risk Analysis

Multinational Cost of Capital and Capital Structure

Long-Term Financing

### **V. Short-Term Asset and Liability Management**

Financing International Trade

Short-Term Financing

International Cash Management

## **IV. Financial Instruments**

**I. Securities and their Valuation**

Bonds, Bond Valuation, and Interest Rates

Risk, Return, and Capital Asset Pricing Model

Portfolio Theory and Other Asset Pricing Models

Stocks, Stock Valuation, and Stock Market Equilibrium

Financial Options and Applications in Corporate Finance

**II. Fixed Income Securities**

Bond Prices and Yields

The Term Structure of Interest Rates

Managing Bond Portfolios

**III. Security Analysis**

Macroeconomic and Industry Analysis

Equity Valuation Models

Financial Statement Analysis

**IV. Options, Derivatives, and Futures**

Options Markets: Introduction

Option Valuation

Futures Markets

Futures and Swaps: Markets and Applications

**V. Financial Services****I. Banking**

Money and Banking

Assets

Liabilities and Shareholders Equity

Other Services/Operations

**II. Insurance**

Products

Processes

**III. Securities**

Products

Processes

**IV. Regulation**

Banking

Securities

Insurance



# General Finance Theory

## **I. General Finance Theory**

### **I. Fundamental Concepts of Financial Management**

Money and Banking

The Investment Environment

Time Value of Money

Asset Classes and Financial Instruments

How Securities are Traded

Mutual Funds and Other Investment Companies

### **II. Portfolio Theory and Practice**

Learning about Return and Risk from the Historical Record

Risk Aversion and Capital Allocation to Risky Assets

Optimal Risky Portfolios

Index Models

### **III. Equilibrium in Capital Markets**

The Capital Asset Pricing Model

Arbitrage Pricing Theory and Multifactor Models of Risk and Return

Efficient Market Hypothesis

Behavioural Finance and Technical Analysis

Empirical Evidence on Security Returns

### **IV. Applied Portfolio Management**

Portfolio Performance Evaluation

International Diversification

Investment Policy and Framework of the CFA Institute

Theory of Active Portfolio Management

# I. Fundamental Concepts of Financial Management

## Money and Banking

-financial sector and banking play an important role in the allocation of capital resources and monetary growth in an economy

-banks: process payments, control risks, and need regulation

### 1. Role of Money and Banking

-bank can lend money up to portion of its reserves

-money has value in relation to purchasing power

-money consists of instruments with certain characteristics and is used for simplicity

### 2. Bond and Stock Markets

-play very crucial liquidity roles in the economy

### 3. Effect of Interest Rate Movements

-lower rates typically stimulate the economy better

-higher rates do not lead to more saving: people save more because of higher rates, but also spend more because they have more now

-the health of the economy affects interest rates by influencing supply of and demand for credit

-interest rates fall in a recession because of less demand for credit, and rise in an expansion because of more demand for credit; government's credit is inversely related to the economy's; they need more in a recession and less in an expansion

### 4. Monetary Management Theories

-the Fed's monetary policies are designed to influence investment spending; lower interest rates serve to stimulate investment activities

#### 4 Theories

1. change the discount rate- decrease encourages borrowing and lending

2. open market operations

3. moral suasion

4. reserve requirements- affects amount of money available for lending

## The Investment Environment

Key attributes of successful companies

-skilled people, strong relationships with groups outside the company, have enough funding to execute their plans and support their operations

## Financial Statements, Cash Flows, Taxes

-net cash flow differs from accounting profit because some of the revenues and expenses reflected in the accounting profits may not have been received or paid out in cash during the year

### 1. Corporate Life Cycle

**1. proprietorship** – unincorporated business owned by 1 person

**2. partnership** – whenever 2 or more people or entities associate to conduct a noncorporate business for profit

\***limited partnership**- general partners and limited partners

\***LLP, LLC**- all partners enjoy limited liability

**3. corporation**- legal entity created by state laws, and its separate and distinct from its owners and managers

**3 advantages**- unlimited life, easy transferability of ownership interest, limited liability

**2 disadvantages**- double taxation: dividends and profits; more regulation

\***charter**- name activities, amount of capital stock, number of directors, names and addresses of directors

\***bylaws**- election process for directors; shareholder rights to new shares; procedures for changing bylaws

### Types

\***professional corporation, association**- doctors, lawyers, accountants

\***S**- differ on tax status only

growing and managing- growth depends on interaction with financial markets

\***IPO**- selling stock to public at large

\***agency problem**

\***corporate governance**- the set of rules that control a company's behaviour towards its directors, managers, employees, owners, creditors, customers, competitors, and community

### 2. Primary Objective: Value Maximization

-primary objective- societal welfare maximization; maximize fundamental stock price

-purchase stock to earn a good return on investment without undue risk exposure

\***market price**- stock price we observe in the financial markets

\***fundamental, intrinsic price**- when the market price reflects all relevant information

-fundamental is hard to attain

### **Stock Price Maximization and Social Welfare**

-the same actions that maximize fundamental stock prices also benefit society

**1. owners of the stock are society**- millions of owners nowadays, not so 75 years ago

**2. consumers benefit**- requires efficient low-cost businesses that produce high-quality goods and services at the lowest possible price

**3. employees benefit**- add more with higher prices, pension plans

-occasionally price rises when lay-off announcements are made (exception to rule)

### **Managerial Actions to Maximize Societal Welfare**

-what determines firm's value: a company's ability to generate cash flows

1. any financial asset, even stock, is valuable only to extent it generates cash flows
2. timing matters- sooner is better
3. investors are risk averse- pay more for stable cash flows

**FCF, free cash flow**= Sales revenues – operating costs – operating taxes – required investments in operating capital

**WACC, weighted average cost of capital**= rate of return required by investors; how to finance the firm

### **3. Capital Allocation Process**

**1. direct transfer**- direct sale to investors

**2. indirect transfer**- investment bank; bank, financial intermediary

\***investment banking house**- underwrites the issue; middleman, facilitates

\***financial intermediary**- bank, mutual fund

### **4. Financial Securities and the Cost of Money**

-variety of financial securities is limited only by human creativity

#### **2 types of financial securities**

1. time until maturity

2. debt, equity, or derivatives

-interest rate (debt) and cost of equity (equity)

#### **fundamental factors affecting the cost of money**

**1. production opportunities**

-ability to turn capital into benefits

**2. time preferences for consumption**

-consumption or saving of current funds

**3. risk**

-higher risk higher return

**4. inflation**

-leads to a higher cost of money

### **Economic Conditions and Policies that Affect the Cost of Money**

**1. Fed Reserve Policy**

-expansionary or contractionary

**2. Federal budget deficit or surplus**

-deficit increases demand for funds from the government; printing more money leads to inflation

**3. Level of business activity**

-recessions or bull market

**4. International factors:** foreign trade balance, international business climate, exchange rates

\***country risk**- arising from economic, political, and social factors

**\*exchange rate risk**- international securities and assets denominated in other currencies

### **5. Financial Institutions**

1. investment banking houses
  2. commercial banks
  3. financial services corporations- big banks
  4. savings and loans- help facilitate home mortgages
  5. mutual savings banks-like S&L's just in the north
  6. credit unions- cooperatives with a common bond
  7. life insurance companies- take savings in form of premiums, invest these, and pay out to beneficiaries
  8. mutual funds- usually can only redeem at close of business; economies of scale
- \*ETF**- allows investors to sell their share at any time during normal trading hours
9. hedge funds- smaller than mutual funds; least heavily regulated
  10. pension funds-

### **6. Financial Markets**

-bring people and organizations together needing money with those having excess funds

1. physical asset (real products); financial asset
2. spot and futures
3. money and capital
4. mortgage and consumer credit
5. world, national, regional, local markets
6. primary and secondary
7. private and public

### **7. Trading Procedures in Financial Markets**

-most trading occurs in the secondary market

1. can be a physical location or a computer/telephone network
2. can be through outcry auction (CBOT), dealers (market makers who maintain records), automated order machine (ECN, electronic communications network)

### **8. Types of Stock Market Transactions**

1. IPO
2. Seasoned equity
3. secondary market

-can be intense competition between markets- NYSE and NASDAQ

### **Real Assets v. Financial Assets**

-wealth of the society is determined by the productive capacity of its economy; the goods and services its citizens can create

**\*real assets**- land, buildings, machines, knowledge

-create wealth

**\*financial assets**- stocks and bonds

-represent claims to all or part of that wealth

-determine how the ownership of real assets is distributed among investors

### Taxonomy of Financial Assets

- 1) **fixed-income securities**- promise either a fixed stream of income or a stream of income that is determined according to a specified formula; no ownership
- 2) **equity**- common stock, ownership in firm
- 3) **derivative securities**- determined by the price of another asset

### Financial Markets and the Economy

-informative role of financial markets- encourage allocation of funds to firms that appear to have best prospects at the given time

-consumption timing- can consume more than current income allows

-allocation of risk- different assets have more risk than other- returns

-separation of ownership and management

\***agency problems**- potential conflicts of interest between managers and owners

-proxy fights to unseat the board can arise

corporate governance and corporate ethics- for markets to effectively serve their purpose, facilitating the deployment of capital to the most productive uses, there must be an acceptable level of transparency that allows investors to make well-informed decisions

### The Investment Process

-saving, investing, and safe investing

\***asset allocation**- choice among broad asset classes; stock, bonds, commodities, real estate; top-down

\***security selection**- the specific securities to hold within each class; bottom-up

\***security analysis**- involves the valuation of particular securities that might be included in the portfolio

### Markets are Competitive

-risk return trade-off- invest for future returns, which cannot be predicted

\***risk-return trade-off**- higher-risk assets priced higher to offer higher expected returns than lower-risk assets

-efficient markets- we should rarely expect to find bargains in the security market

\***passive management**- calls for holding highly diversified portfolios without spending effort or other resources attempting to; make sense in efficient markets

\***active management**- the attempt to improve financial performance either by identifying mispriced securities or by timing the performance of broad asset classes; switching to stocks from bonds

### The Players

1. firms are net borrowers
2. households are net savers
3. governments can be borrowers or lenders, depending on tax revenue and government expenditures
4. **Financial intermediaries**- banks, investment companies, insurance companies, and credit unions; evolved to bring the big 3 together; makes the spread from facilitating

\***investment companies**- pool and manage the money of many investors; arose out of economies of scale

\***investment bankers**- advise the issuing corporation on the prices it can charge for the securities issued, appropriate interest rates

\***primary market**- new issues of securities are offered to the public

\***secondary market**- where investors can trade securities among themselves

### **Recent Trends**

**1. globalization**- encouraged by efficient communication technology and the dismantling of regulatory constraints; ADRs and WEBS

**2. securitization**- means mortgages can be traded like other securities

\***pass-through securities**- aggregate individual home mortgages into relatively homogeneous pools; Brady Bonds: student loans; home equity, credit cards, autos, debts

**3. financial engineering**- use of mathematical models and computer-based trading technology to synthesize new financial instruments

\***protected equity-linked note**- issued by financial intermediaries, that guarantee a minimum fixed return plus an additional amount that depends on the performance of some specified stock-index, like the S&P 500

\***unbundling**- breaking up and allocating the cash flows from 1 security to create several new securities

\***bundling**- combining more than 1 security into a composite security

**4. computer networks**- online trading



## Time Value of Money

-time value of money; discounted cash flow analysis DCF

### Future Values

\***compounding**- going to future values from present

### Present Values

\***discounting**- reverse compounding

-interest rate and number of years

\***annuity**- payments are equal and at fixed payments

\***ordinary annuity**- payments due at end of each period; mortgages, car loans

\***annuity due**- payments due at beginning of each period; rent, life insurance

\***growing annuity**- when money is taken out at a growing rate while the lump sum is still growing; to account for inflation

\***perpetuities**- a simple annuity with an extended life

### Uneven Cash Flows

-uneven stream (dividends); stream with lump sum at end (insurance)

\***terminal value**- future value of uneven cash flow stream

### Semiannual and Other Compounding Periods

-if compounding occurs more frequently than once a year, then the nominal rate must be converted to the periodic rate

-APR v. EAR

-continuous compounding

\***amortized loans**- to be paid back in equal payments on a monthly, quarterly, or annual basis; amortization schedule; mortgages

## Asset Classes and Financial Instruments

### The Money Market

-sub-sector of fixed income market

-low risk, low yield

1. US treasury bills- 28,91, or 182 days
2. Certificates of deposit- 3 months normally
3. commercial paper- up to 270 days- within 1 to 2 months usually
4. banker's acceptances- foreign trade, 6 months
5. Eurodollars- dollars in foreign banks
6. repos and reserves- overnight borrowing
7. federal funds- overnight between banks
8. brokers' calls- for margin with stock
9. LIBOR market- London fed funds rate; Euro bank as well

### The Bond market

1. Treasury notes and bonds

2. inflation protected treasury bonds

-TIPS

3. federal agency debt

4. international bonds

5. municipal bonds

-general obligation, revenue, industrial development, tax-anticipation notes

**\*equivalent tax yield-** the rate a taxable bond must offer to match the after-tax yield on tax-free bonds

6. corporate bonds

-secured, debentures, subordinated debentures, callable, convertible

7. mortgages and mortgage-backed securities

-adjustable rate mortgage, mortgage-backed security,

**\*pass-through-** pools of mortgages sold in 1 package; owners receive the principal and interest payments made by the borrowers; originator just services it and passes it; government may guarantee payments

### Equity Securities

1. equity

represent ownership in the corporation

-limited liability and residual claim.

**\*price-earnings ratio-** current stock price to last earnings earnings per share

2. preferred stock

-bond and equity features

### Stock and Bond Market Indexes

-equal or value-weighted; price or volume

**\*index fund-** yield a return equal to that of the index;. Low-cost passive investment strategy for investors

### **Derivatives Markets**

-derivative assets, contingent claims

#### **1. Options**

**\*call option-** gives the owner the right to purchase an asset for the strike price, on or before a specified date

**\*put option-** gives the holder the right to sell an asset for a specified exercise price on or before a specified expiration date

#### **2. Futures**

**\*futures contract-** calls for delivery of an asset at a specified delivery or maturity date at the futures price, to be paid at contract maturity; long is purchasing and short is selling

## How Securities are Traded

### How Firms Issue Securities

-IPO and seasoned

1. investment banking

-underwriters, red herring, prospectus, firm commitment, tombstone

2. shelf registration

-2 years to sell; short notice sales

3. private placements

4. initial public offerings

### How Securities are Traded

#### **Types of markets**

1. direct search markets

-least organized; classifieds

2. brokered markets

-real estate and the primary offering market

3. dealer markets

-OTC markets; NASDAQ

4. auction markets

-most integrated; NYSE

#### **Types of orders**

1. market orders

-to be executed immediately at market prices

2. price-contingent orders

\***limit sell**- sell if the stock rises above a specified limit

\***limit buy**- buy if the stock is below a certain price

\***stop sell**- sell if the stock falls below a specified price

\***stop buy**- buy if the stock rises above a specified limit

#### **Trading mechanisms**

1. dealer markets- OTC, original NASDAQ; price quotation system

2. ECN- electronic communication network; NASDAQ now; trading system

-INET, Archipelago, Bloomberg

3. specialist markets; NYSE, people actually

#### **US/Other Countries Securities Markets**

\***block sales**- sales of 10,000 or more stock

\***program trade**- used for indexes and portfolios; superdot

-most bond trading occurs OTC market among bond dealers, even for NYSE listed bonds

-London, Euronext (Paris, Amsterdam, Brussels), Tokyo

-NYSEuronext; many exchanges are now having to merge

**\*margin-** the part of the purchase price contributed by the investor; maintenance and margin call

**\*short sale-** profiting from the decline of an asset with assets the investor does not own  
-regulation is from SEC, exchanges, and other government agencies

## Mutual Funds and Other Investment Companies

### Investment Companies

\***investment companies**- financial intermediaries that collect funds from individual investors and invest those funds in a potentially wide range of securities or other assets  
-record keeping and administration, diversification and divisibility, professional management, lower transaction costs

**1. Unit investment trusts**-pools of money invested in a portfolio that is fixed for the life of the fund; unmanaged, redeemable trust certificates

**2. managed investment companies**- annual fee is .2-2% of assets; most common type

\***closed-end**- do not redeem or issue shares; sell back to other investors; on NYSE

\***open-end**- stand ready to redeem or issue shares at their net value; sell back to the fund

\***load**- offering price will exceed NAV if there is a load

**3. commingled funds**- partnerships of investors that pool their money together

-similar to open-end funds; but, funds bigger than individual but too small to manage singly

**4. real estate investment trusts REIT**- similar to a close-end fund; highly leveraged, with a 70% debt ratio

\***equity trusts**- deal with real estate directly

\***mortgage trusts**- invest primarily in mortgage and construction loans

**5. hedge funds**- allow private investors to pool funds to be managed privately

-subject to little regulation, manager takes an incentive cut as well, have a lock-down clause requiring funds for a certain amount of time

\***net asset value NAV**- MV assets – liabilities of und/ shares outstanding

### Mutual Funds

-each fund has different investment policies

-are often sold through revenue sharing, where the fund pays the broker to advertise their fund

-advantages for large scale investors, like reduced transaction fees

**1. money market funds**- invest in money market securities, and NAV fixed at \$1 per share, so no taxes; check-writing features

**2. equity funds**-invest primarily in stock, with 4-5% in money markets for liquidity purposes

-income, growth, and sector funds

**3. bond funds**- specialize in the fixed-income sector

-any kind of bonds

**4. international funds**

-global, international, regional, emerging

**5. balanced funds**- hold equities and fixed-income in balance; life-cycle funds

**6. asset allocation and flexible funds**

-similar to balanced, but the proportions may vary widely

## 7. index funds

-tied to a set of firms, like the S&P 500

### Costs of

1. front-end load- sales charges
2. back-end load- redemption fees; contingent-deferred sales charges
3. operating expenses- administrative and advisory; .2-2%
4. 12b-1 charges- recruiting fees used to pay the expenses of marketing the fund to the public

**\*soft dollars**- credits earned by manager by directing fund's trades to a broker; the broker then pays expenses like databases for the manager, and a lower expense ratio can be reported

### Taxation of

-income earned on mutual fund portfolios is not taxed at the level of the fund; as long as the fund meets pass-through status, the income is treated as being earned by the investors in the fund

**\*exchange traded fund ETF**- offshoots of mutual funds that allow trading like equities  
-can be traded any time; can be shorted and purchased on margin; are cheaper than mutual funds as well

-average rate of return of the average equity mutual fund in the last 25 years has been below that of a passive index holding a portfolio to replicate a major index

## II. Portfolio Theory and Practice

### Learning About Return and Risk from the Historical Record

#### Determinants of the level of interest rates

-economy's equilibrium level of real interest rates depends on: supply, demand, and government actions

\***nominal**- growth rate of your money

\***real**- growth rate of purchasing power; equal to nominal minus inflation

-tax liabilities are based on nominal income; tax brackets are indexed to inflation

#### Comparing rates of return for different holding periods

-EAR v. APR, continuous compounding

-equilibrium expected rate of return on any security is sum of: equilibrium real rate of interest, expected rate of inflation, and a security-specific risk premium

#### Risk and risk premium

-investments in risky portfolios do not become safer in the long run; the longer a risky investment is held, the greater the risk

\***holding period return HPR**- ending price of share – beginning price + cash dividend / beginning price; dividend yield plus capital gains yield

-dividend yield, capital gains yield, risk-free rate, risk premium, excess return, risk aversion

-assets with guaranteed nominal interest rates are risky in real terms because the future inflation rate is uncertain

#### Deviation from normality

-historical returns on stock exhibit more frequent large deviation negative deviations from the mean than would be expected from a normal distribution; the LPSD and the skewness of the actual distribution quantify the distribution from normality

-in well-functioning capital markets, we would expect excess returns from successive years to be uncorrelated

\***skew**- uses the ratio of the average cubed deviations from the mean to the cubed standard deviation to measure asymmetry or “skewness”

\***kurtosis**- measure of the degree of fat tails



\***sharpe ratio**- reward to variability; risk premium/ SD of excess return

\***lognormal**- describes the distribution of a variable whose logarithm is normally distributed

\***lower partial standard deviation LPSD**- sometimes instead of standard deviation as a measure of risk

\***value at risk VaR**- measures the loss that will be exceeded within a specific probability; does not add new information when returns are normally distributed

\***conditional tail expectations CTE**- measure the expected rate of return conditional on the portfolio falling below a certain value

## Risk Aversion and Capital Allocation to Risky Assets

-portfolio creation process: 1) decide on risky assets 2) decide how much to put into risky assets opposed to safe assets

### Risk and risk aversion

\***risk premium**- expected excess return

\***speculation**- the assumption of considerable investment risk to obtain commensurate gain

-the undertaking of a risky investment for its risk premium; the risk premium has to be large enough to compensate a risk-averse investor for the risk of the investment

\***fair game**- risky investment with a risk premium of 0; gambling

-will not be undertaken by a risk-averse investor

\***risk aversion**- reject investment portfolios that are fair games or worse; only willing to consider risk-free or speculative projects with positive risk premiums;  $A > 0$

\***utility**- welfare score assigned to competing portfolios based on the expected risk and return of those portfolios

-investors preferences toward the expected return and volatility of a portfolio may be expressed by a utility function that is higher for higher expected returns and lower for higher portfolio variances; more risk-averse investors will apply greater penalties for risk; described using indifference curves

\***certainty equivalent rate**- the utility score of risky portfolios; the rate that risk-free investments would need to offer to provide the same utility score as a risky portfolio would

-the desirability of a risky portfolio to a risk-averse investor; a value, that if received with certainty, would yield the same utility as the risky portfolio

\***risk neutral**- judge risky prospects solely by their expected rates of return; level of relevant risk is irrelevant; certainty equivalent rate is equal to the expected rate of return;  $A = 0$

\***risk lover**- willing to engage in fair games and gambles; adjusts the expected return upwards to take into account the "fun" of confronting the prospect's risk; always accept the fair game;  $A < 0$

\***mean-variance criterion**- quadrant I is always preferred, the northwest corner; this is where the expected return is always equal to or greater than P's and the standard deviation is equal to or smaller than P's

\***indifference curve**- the equally preferred portfolios will lie in the mean-standard deviation plane on this curve that connects all portfolio points with the same values

-shows, at any level of expected return and risk, the required risk premium for taking on 1 additional % point of standard deviation

-the investor's degree of risk aversion is characterized by the slope of his indifference curve; more risk-averse investors have steeper indifference curves, they require a greater risk-premium for taking in more risk

\***complete portfolio**- includes the risk-free and risky assets

### Ways to reduce risk

1. shift funds from the risky portfolio to the risk-free asset; simplest way
2. diversification of the risky portfolio
3. hedging

**\*risk-free asset-** T-bills; short-term nature makes their interest rates insensitive to interest rates fluctuations; money market funds as well  
 -T-bills provide a perfectly risk-free asset in nominal terms only; but, the standard deviation on real rates in short-term T-bills is small compared to that of other assets

**\*capital allocation line CAL-** straight line; depicts all the risk-return combinations available to investors

-all other things equal, the investor will prefer steeper-sloping CAL, because that means higher expected rates of return for any level of risk

-if the borrowing rate is greater than the lending rate, the CAL will be kinked at the point of the risky asset

**\*reward-to-variability (Sharpe) ratio-** the slope of the CAL; used to characterize the investor's risky portfolio

-the optimal position in the risky asset is proportional to the risk premium and inversely proportional to the variance and degree of risk aversion

**\*passive strategy-** a portfolio decision that avoids any direct or indirect security analysis; buying an index of stocks; S&P 500

**\*capital market line CML-** the capital allocation line provided by 1 month T-bills and a broad index of common stocks; generated by a passive investment strategy

## Optimal Risky Portfolios

Top-down investment process: 1) capital allocation between the risky and risk-free assets  
2) asset allocation across broad asset classes 3) security selection of individual assets

### Diversification and Portfolio Risk

\***diversification**- including different securities into the portfolio

\***insurance principle**- the reduction of risk to very low levels in the case independent risk; insurance companies issue many different policies

\***market risk, systematic risk, nondiversifiable**- risk attributable to marketwide risk sources; remains even after diversification; war, inflation, recessions, interest rates

\***unique risk, firm-specific risk, nonsystematic risk, diversifiable risk**- risk that can be eliminated through diversification' lawsuits, strikes, marketing

### Asset Allocation

-even if the covariance term is positive, the portfolio standard deviation is still less than the weighted average of the individual security standard deviation, unless the 2 securities are perfectly positively correlated; thus, portfolio diversification is of value as long as the assets are not perfectly correlated

-portfolios of less than perfectly correlated assets always offer better risk-return opportunities than the individual component securities on their own

\***portfolio expected return**- the weighted average of the component security expected returns with the investment proportions as weights

\***portfolio variance**- the weighted sum of the elements of the covariance matrix with the product of the investment proportions as weights; the variance of each asset is weighed by the square of its investment proportion

-each covariance of any pair of assets is appear twice in the covariance matrix; thus, the portfolio variance includes twice each covariance weighted by the product of the investment proportions in each of the 2 assets

-the greater an asset's covariance with other assets in the portfolio, the more it contributes to portfolio variance

-a hedge asset has a negative correlation with the other assets in the portfolio

\***minimum-variance portfolio**- has a standard deviation smaller than that of either of the individual component assets

\***portfolio opportunity set**- shows all the combinations of portfolio expected return and standard deviation that can be constructed from the 2 available assets

\***optimal risky portfolio**- combined with the complete portfolio is obtain the optimal proportion of the complete portfolio to invest in the risky component

## **Markowitz Portfolio Selection Model**

### **1. security selection**

\***minimum-variance frontier**- summarizes the risk-return opportunities available to the investor in graphical form; first step

\***efficient frontier of risky assets**- the part of the frontier that lies above the global minimum-variance portfolio

-the efficient frontier is the graphical representation of a set of portfolios that maximize expected return for each level of portfolio risk; rational investors choose a portfolio on the efficient frontier

-a portfolio manager identifies the efficient frontier by first establishing estimates for asset expected returns and the covariance matrix; the input list is then fed into an optimization program that reports output as the: investment proportions, expected returns and standard deviations of the portfolios on the efficient frontier

\***input list**- the group of estimates the manager collects

-portfolio managers arrive at different efficient portfolios because of differences in methods and quality of security analysis

### **2. capital allocation and the separation property**

\***separation property**- portfolio choice problem is 2 tasks: 1) determination of the optimal risky portfolio, purely technical 2) allocation of the complete portfolio to T-bills versus the risky portfolio, depends on personal preference

-if a risk-free asset is available and all input lists are identical, then all investor will choose the same portfolio on the efficient frontier of risky assets; the portfolio tangent to the CAL

-all investors with identical lists will hold an identical risky portfolio, differing only in how much each allocates to this optimal portfolio and to the risk-free asset

### **3. power of diversification**

-diversification is based on the allocation of a fixed portfolio across several assets

-adding more risky assets or over a longer time horizon does not reduce risk

### **4. asset allocation and security selection**

-identical processes

\***risk pooling**- the assumption of ever more sources of risk; may increase rate of return predictability, but not the predictability of total dollar returns

\***risk sharing**- the spreading of risk among many investors, each of whom takes on only a small exposure to any given source of risk

## **2 drawbacks to Markowitz procedure**

1. requires huge number of estimates to fill the covariance matrix

2. does not provide any guideline to the forecasting of the security risk premiums that are essential to construct the efficient frontier of risky assets

## Index Models

### Single Factor/Index Model

-a single factor model of the economy classifies sources of uncertainty as systematic (macroeconomic) or firm-specific (microeconomic)

-the single index model assumes that the macro factor can be represented by a broad index of stock returns

\***single factor model**- uses only 1 input

\***single index model**- uses the market index to proxy for the common factor

\***security characteristic line SCL**- the regression line that describes the expected return

### **Single-Index model preparation list**

1. macroeconomic analysis is used to estimate the risk premium and the risk of the market index
2. statistical analysis is used to estimate the beta coefficients of all securities and their residual variances
3. the portfolio manager uses the estimates for the market-index risk premium and the beta coefficient of a security to establish the expected return of that security absent any contribution from security analysis; the market-driven expected return is conditional on information common to all securities, not on information gleaned from security analysis of particular firms; the market-driven expected return can be used as a benchmark
4. security-specific expected return forecasts (specifically, security alphas) are derived from various security-valuation models; thus, the alpha value distills the incremental risk premium attributable to private information developed from security analysis

### **Input list**

1. risk premium on S&P 500 portfolio
2. estimate of the standard deviation of the S&P portfolio
3. n sets of estimates of (a) beta coefficients (b) stock residual variances (c) alpha values

-the single index model drastically reduces the necessary inputs in the Markowitz portfolio selection procedure; it also aids in specialization of labour in security analysis

-according to the index model specification, the systematic risk of a portfolio or asset equals  $\beta^2 \tilde{\sigma}_M^2$  and the covariance between 2 assets equals  $2\beta_1\beta_2 \tilde{\sigma}_M^2$

-the index model is estimated by applying regression analysis to excess rates of return; the slope of the regression curve is the beta of the asset, whereas the intercept is the asset's alpha during the sample period; the regression line is called the security characteristic line

-optimal active portfolios constructed from the index model include analyzed securities in proportion to their information ratios; the full risky portfolio is a mixture of the active portfolio and the passive market index portfolio; the index portfolio is used to enhance the diversification of the overall risky position

\***information ratio**- alpha/residual standard deviation; measures the extra return we can obtain from security analysis compared to the firm-specific risk we incur when we over or underweight securities relative to the passive market index

**Practical Aspects**

-practitioners routinely estimate the index model using total rather than excess rates of return

-betas show a tendency to evolve toward 1 over time; beta forecasting rules attempt to predict this drift

**\*tracking portfolio**- designed to match the systematic component of the portfolio's return; the idea is for the portfolio to track the market-sensitive component of P's return; the tracking portfolio must have the same beta on the index portfolio as P and as little nonsystematic risk as possible

# III. Equilibrium in Capital Markets

## The Capital Asset Pricing Model

### CAPM

-assumes that investors are single-period planners who agree on a common input list from security analysis and seek mean-variance optimal portfolios

-is a value-weighted portfolio; uses market values for each security divided by total market value of the portfolio

### **CAPM assumptions about security markets**

1. they are large, and investors are price-takers
2. there are no taxes or transaction costs
3. all risky assets are publicly traded
4. investors can borrow and lend any amount at a fixed risk-free rate (homogenous expectations)
5. investors plan for 1 holding period
6. investors are rational mean-variance optimizers, meaning they all use the Markowitz portfolio selection model

-with these assumptions, all investors hold identical risky portfolios; the CAPM holds that in equilibrium the market portfolio is the unique mean-variance efficient tangency portfolio; a passive strategy is efficient

### **Prevailing equilibrium in this hypothetical world**

1. the risk premium on the market portfolio is proportional to its variance, and to the average coefficient of risk aversion across investors, if the market portfolio is efficient and the average investor does not borrow or lend
2. CAPM implies that the risk premium on any individual asset or portfolio is the product of the risk premium on the market portfolio and the beta coefficient, where the beta coefficient is the covariance of the asset with the market portfolio as a fraction of the variance of the market portfolio
3. investors will choose portfolios that are similar in composition to the market portfolio of all assets
4. the market portfolio will be on the efficient frontier, as well as the tangency portfolio to the optimal capital allocation asset line CAL, derived by each and every investor; as a



result, the capital market line CML, the line from the risk-free rate through the market portfolio, is also the best attainable capital allocation line

-all investors hold the market portfolio

-passive strategy is efficient

-risk premium of the market portfolio

\***mutual fund theorem**- the passive strategy of investing in a market index portfolio is efficient

-expected returns on individual securities

\***market price of risk**- quantifies the extra return that investors demand to bear portfolio risk

\***expected beta-return relationship**- most familiar CAPM expression to practitioners

\***beta**- stock variance/ portfolio variance

\***security market line SML**- graphic depiction of the expected return-beta relationship

-must be modified to account for labour income and other significant nontraded assets

\***alpha**- difference between the fair and actually expected rates of return on a stock

### CAPM and Index Model

-actual returns v. expected returns

-the index model and realized returns

-the index model and the expected return-beat relationship

\***market model**- the return surprise of any security is proportional to the return surprise of the market, plus a firm-specific surprise

-CAPM fails empirical tests, but is still used widely in many countries and industries

-CAPM assumes that alpha values will equal 0 in security market equilibrium; really means that alphas should be taken to be 0 in the absence of security market analysis

-GLS accounts for correlation across residuals

### **Efficient Frontier Portfolios Characteristics**

1. any portfolio that is a combination of 2 frontier portfolios is itself on the efficient frontier

2. the expected return of any asset can be expressed as an exact linear function of the expected return on any 2 efficient-frontier portfolios P and Q

3. every portfolio on the efficient frontier has a companion portfolio

\***zero-beta portfolio**- the uncorrelated, companion portfolio that is on the bottom (inefficient) half of the portfolio

\***ICAPM, intertemporal** - predicts the same expected return-beta relationship as the single-period equation; multi-factor extension of the single-factor CAPM

-simple version of the CAPM assumes that investors are myopic; when investors are assumed to be concerned with lifetime consumption and bequest plans, but investor's tastes and security return distributions are stable over time, the market portfolio remains efficient and the simple version of the expected return-beta relationship holds; but if those distributions change unpredictably, or if investors seek to hedge nonmarket sources of risk to their consumption, the simple CAPM will give way to a multifactor version in which the security's exposure to these nonmarket sources of risk command risk premiums

\***liquidity**- the speed and ease with which an asset can be sold at fair market value in a timely fashion

\***illiquidity**- the discount from fair market value a seller must accept if the asset is to be sold quickly; perfectly liquid assets have no illiquidity discount

-liquidity costs and liquidity risks can be incorporated into the CAPM relationship; investors demand compensation for both expected costs of illiquidity and the risk surrounding those costs

## Arbitrage Pricing Theory and Multifactor Models of Risk and Return

**\*arbitrage**- the exploitation of security mispricing in such a way that risk-free profits can be made

### Multifactor Models

-seek to improve the explanatory power of single-factor models by explicitly accounting for various systematic components of security risk; these models use indicators intended to capture a wide range of macroeconomic risk factors

**\*factor sensitivities, factor loadings, factor betas**- coefficients

-macro factors have expectations of 0

$$r = E(r) + B_{GDP} + B_{IR} + e$$

-factor betas provide a framework for hedging strategy

-once we allow for multiple risk factors, we conclude that the security market line also ought to be multi-dimensional, with exposure to each risk factor contributing to the total risk premium of the security

-CAPM asserts that securities will be priced to give investors an expected return comprised of 2 components: risk-free rate (compensation for time value of money) and a risk premium

-beta measures the exposure of a stock or portfolio to marketwide or macroeconomic risk; so the SML says investors are rewarded with a higher expected return for their exposure to macro risk, based both on the sensitivity to that risk (beta) as well as the compensation for bearing each unit of that risk (risk premium  $RP_m$ ), but are not rewarded for exposure to firm-specific uncertainty (residual term  $e$ )

### **2 factor economy, expected return on security depends on:**

-risk-free rate of return, sensitivity to GDP risk (GDP beta) times the risk premium for GDP risk; and the sensitivity to IR risk (IR beta) times the risk premium for IR risk

-1 difference between a single and multi-factor model is that a factor risk premium can be negative

### Arbitrage Pricing Theory

-developed by Stephen Ross (1976)

-like the CAPM, it predicts a SML linking expected returns to risk, but that path it takes to the SML is quite different

3 propositions of APT

1. security returns can be described by a factor model
2. there are sufficient securities to diversify away idiosyncratic risk
3. well-functioning security markets do not allow for the persistence of arbitrage opportunities

-a risk free (arbitrage) opportunity arises when 2 or more security prices enable investors to construct a 0 net investment portfolio that will yield a sure profit; the presence of arbitrage opportunities will generate a large volume of trades that puts pressure on security prices; this pressure will continue until prices reach levels that preclude such arbitrage

**\*Law of 1 Price-** when 2 assets are equivalent in all economically relevant aspects, they should have the same market price; when violated, arbitrageurs will pounce  
-most fundamental concept in capital market theory; investors want an infinite position in this opportunity

**\*dominance argument-** CAPM, many investors will make small changes for arbitrage

**\*risk-return argument-** APT, a few investors will make big changes for arbitrage

**\*no-arbitrage condition-** when securities are priced so that there is no risk-free arbitrage; price relationships that satisfy the no-arbitrage condition are important because we expect them to hold in real world markets

-in a single-factor security market, all well-diversified portfolios have to satisfy the expected return-beta relationship of the CAPM to satisfy the no-arbitrage condition; if all well-diversified portfolios satisfy the expected-return –beta relationship, then all but a small number of securities also must satisfy this relationship

-APT does not require the restrictive assumptions of the CAPM and its unobservable market portfolio; the price of this generality is that the APT does not guarantee this relationship for all securities at all times

-APT does not require that the benchmark portfolio in the SML relationship be the true market portfolio

-for arbitrage opportunities to be ruled out, each well-diversified portfolio's expected return must be proportional to its beta

### **Multifactor APT**

-generalizes the single-factor model to accommodate several sources of systematic risk; the multidimensional security line predicts that exposure to each risk factor contributes to the security's total risk premium by an amount equal to the factor beta times the risk premium of the factor portfolio that tracks that source of risk

-ICAPM is a model of risk return trade-off that predicts the same multidimensional security market line as the APT; ICAPM suggests that priced risk factors will be those sources of risk that lead to significant hedging demand by a substantial fraction of investors

**\*factor portfolio, tracking** - a well-diversified portfolio constructed to have a beta of 1 on 1 of the factors and a beta of 0 on any other factor

**Shortcoming of APT**

-no guidance concerning the determination of the relevant risk factors or their risk premiums; 2 principles for factors

1. limit ourselves to systematic factors with considerable ability to explain security returns

2. choose factors that seem likely to be important risk factors; those that concern investors sufficiently that they will demand meaningful risk premiums to bear exposure to those sources of risk

-Fama-French model is one of these

## The Efficient Market Hypothesis

### Random Walks and the Efficient Market Hypothesis

\***random walk**- price change should be random and unpredictable

-stock prices follow a random walk with no discernable patterns investors can exploit, meaning markets are efficient; only new information can move markets, either good or bad

\***EMH**- the notion that stocks already reflect all available information

-competition as the source of efficiency

\***weak-form**-stock prices already reflect all information that can be derived by examining market trading data such as history of past prices, trading volume, or short interest

\***semi-strong form**-all publicly available information regarding the prospects of the firm must be reflected in the stock price

\***strong form**- stock prices reflect all information relevant to the firm, even insider

### **Implications**

\***technical analysis**- the search for recurrent and predictable patterns in stock prices

-focuses on stock price patterns and on proxies for buy or sell pressure in the market

\***fundamental analysis**- uses earnings and dividends prospects of the firm, expectations of future interest rates, and risk evaluation to determine proper stock prices

-focuses on the determinants of the underlying value of the firm, such as current profitability and growth prospects

-neither should generate profits since based on public information

-EMH advocates passive investment strategy (index fund), because it doesn't waste time and money on research and consistent stock trades

### Event Studies

-used to evaluate the economic impact of events of interest using abnormal stock returns

-usually show there is some leakage of inside information to some market participants before the public announcement date; CAR

### Markets Efficient?

#### **Issues**

##### **1. magnitude issue**

-the more money under control the more a small percentage increase creates

##### **2. selection bias issue**

-people won't report findings that can make them money

##### **3. lucky event issue**

-stock market is gambling; 50-50 win or lose

#### **Tests**

**1. Weak-form: patterns in stock returns ( technical analysis)**

A. returns over short horizons

\***momentum effect**- recent good or bad performance of particular stocks continues over time

B. returns over long horizons

-found a pronounced negative effect; overreaction to bad news

**2. Semi-strong form: market anomalies (fundamental analysis)**

A. small-firm in January effect

-small firms do better in January

B. neglected-firm effect and liquidity effects

-less liquid firms have higher returns; firms with less research have better returns

C. book-to-market ratios

-Fama French found BM ratios as a powerful predictor of returns

D. post-earnings announcement drift

-there is a sluggish response to firms following their earnings announcements; should be a quick response

**3. Strong-form**

-insider information does happen

-mutual Fund and Analyst Performance- there is no correlation between mutual fund manager and stock performance; there is no best manager

## Behavioural Finance and Technical Analysis

-EMH 2 hypotheses: security prices properly reflect available information; passive is better than active

### **The Behavioural Critique**

\***behavioural finance**- conventional finance theory ignores how real people make decisions and that people make a difference

-focuses on systematic irrationalities that characterize investor decision making; these behavioural anomalies may be consistent with several efficient market anomalies

### **Information Processing**

1. Forecasting errors (memory bias)
  - people give too much weight to recent experience
2. Overconfidence
  - people overestimate their abilities
3. Conservatism
  - investors are too slow to react
4. sample size neglect and representativeness
  - people do take into account the size of a sample

### **Behavioural Tendencies**

1. framing
  - depends on how the question is asked
2. mental accounting
  - form of framing; similar situations get different responses
3. regret avoidance
  - more regret for unconventional decisions
4. loss aversion (prospect theory)
  - views losses in terms of current wealth

### **Limits to arbitrage**

-limits to arbitrage activity impede the ability of rational investors to exploit pricing errors induced by behavioural investors

1. fundamental risk- even if a security is mispriced, it can still be risky to exploit the mispricing
2. implementation costs- buying and selling the stock
3. model risk- you are using a faulty model
4. costs to short-selling- borrowing on credit

### **Limits to arbitrage and the law of 1 price**

1. siamese twin companies



-royal and dutch and shell; same company but different profit distribution; there was an anomaly in pricing but the market did not balance properly

2. equity-carve outs

-when a company spins off a division into a company, price differences may exist

3. closed-end funds

-usually are issued as premiums and sold at discounts

-the various limits to arbitrage mean that even if prices do not equal intrinsic value, it still may be difficult to exploit the mispricing; as a result, the failure of traders to beat the market may not be proof that markets are efficient, with prices equal to intrinsic value

-bubbles result from behavioural economics

### **Technical Analysis and Behavioural Finance**

-the search for recurring and predictable patterns in stock prices; based on the premise that prices only gradually close in on intrinsic value; as fundamentals shift, astute traders can exploit the adjustment to a new equilibrium

### **Trends and Correlations**

#### **1. Dow theory**

-grandfather of trend analysis

3 forces simultaneously affect stock prices:

\***primary trend**- long-term movement of prices, several months to several years

\***secondary intermediate trends**- short-term deviations from the primary trend

\***tertiary or minor trends**- daily fluctuations of little importance

\***Elliot theory**- predictive broad movements can be discerned from this

\***Kondratieff theory**- macro waves are 48-60 years each; difficult to test

#### **2. Moving averages**

-the average level of the index over a given period of time

#### **3. Breadth**

- a measure of the extent to which movement in a market index is reflected widely in the price movements of all the stocks in the market

### **Sentiment Indicators**

#### **1. Trin statistic**

-the ratio of the average volume in declining issues to average volume in advancing issues

-ratios above 1 are considered bearish

= (volume declining/number declining)/(volume advancing/number advancing)

#### **2. Confidence index**

-the ratio of the average yield on 10 top-rated corporate bonds divided by the average yield on 10 intermediate yield corporate bonds

-will always be below 100% because higher rated bonds will offer lower promised yields to maturity

-higher values of the confidence index are bullish signals

3. Put/call ratio

- the ratio of outstanding put to call options; typically around 65%
- a rising ratio is bearish
- puts do well in falling markets, and calls in rising markets

## Empirical Evidence on Security Returns

### The index-model and the single factor APT

- the single-factor expected return-beta relationship has not been proven scientifically, its use is still commonplace in everyday life
- use first-pass and second-pass regressions to estimate the SCL and SML for the expected return-beta relationship

### Tests of the CAPM

- early tests of the CAPM rejected the SML, finding that nonsystematic risk did explain average security returns
- later tests controlling for the measurement error in beta found that nonsystematic risk does not explain portfolio returns but also that the estimated SML is too flat compared with what the CAPM would predict

### **The market index**

#### **Rolls critique**

1. there is a single testable hypothesis associated with CAPM; the market portfolio is mean-variance efficient
  2. therefore tests of the linearity of the expected-return beta relationship do not bear on the validity of the model; no other tests are possible except #1
  3. using ex post betas calculated against the portfolios will produce the SML relation regardless of whether or not the true market portfolio is mean-variance efficient or not, because the betas were calculated ex ante and thus have different information
  4. CAPM is not testable unless we know the exact composition of the true market portfolio and use it in the tests
  5. using a proxy such as S&P 500 is subject to 2 issues: 1. the proxy may be mean-variance efficient even when the true market portfolio is not, and conversely
- \***benchmark error**- the use of an incorrect benchmark (market proxy) portfolio in the tests of theory

- tests of the mean-variance efficiency of professionally managed portfolios against the benchmark of a prespecified market index conform with Roll's critique in that they provide evidence of the efficiency of the prespecified market index
- empirical evidence suggests that most professionally managed portfolios are outperformed by market indexes, which lends weight to acceptance of the efficiency of those indexes and hence the CAPM
- there is also a beta measurement error associated with CAPM

#### **CAPM empirical conclusions**

1. The insights that are supported by CAPM and APT
  - a. expected rates of return are linear and increase with beta, the measure of systematic risk
  - b. expected rates of return are not affected by nonsystematic risk

2. The single-variable expected return-beta relationship predicted by either the risk-free rate or the zero-beta version of the CAPM is not fully consistent with empirical observations

### **Accounting for human capital and cyclical variations**

#### **2 important deficiencies of the tests of single-index models**

1. only a fraction of the value of the assets is traded in capital markets; perhaps the most important is human capital
2. there is ample evidence that asset betas are cyclical and that accounting for this cyclical variation may improve the predictive power of the CAPM

-work with economic factors suggests that factors such as unanticipated inflation do play a role in the expected return-beta relationship of security returns

-tests of the single-index model that account for human capital and cyclical variations in asset betas are far more consistent with the single-index CAPM and APT; these tests suggest that macroeconomic variables are not necessary to explain expected returns; moreover, anomalies such as effects of size and BM ratios disappear once these variables are accounted for

-accounting for nontraded business is another relevant issue

### **Tests of multifactor CAPM and APT**

-the multifactor CAPM and APT are elegant theories of how exposure to systematic risk factors should influence expected returns, but they provide little guidance concerning what factors (sources of risk) ought to result in risk premiums

#### **3 stages to this hypothesis test**

1. specification of risk factors
2. identification of portfolios that hedge these fundamental risk factors
3. test of the explanatory power and risk premiums of the hedge portfolios

### **Variables to proxy for systematic risk in the macrofactor model**

1. IP= growth rate in industrial production
2. EI= changes in expected inflation measured by changes in short-term (T—bill) interest rates
3. UI= unexpected inflation: actual - expected
4. CG= unexpected changes in risk premium; return on corporate Baa bonds – long-term government bonds
5. GB= unexpected changes in term premium; returns on short and long term government bonds

### **Fama-French 3 factor model**

#### **Factor loadings**

1. HML- high minus low
2. SMB- small minus big
3. BM

#### **State variables**

1. DIV- market dividend yield

2. DEFLT= default spread on corporate bonds (Baa- Aaa)
3. TERM= term structure spread (10 year – 1 year Treasury rates)
- 4 TB= 1 month T-bill rate

### **Time Varying Volatility**

-volatility of stock returns is constantly changing; contemporary researchers use the variations of the ARCH algorithm to estimate the level of volatility and its effect on mean returns

-liquidity and asset pricing also is important issue

### **Equity Premium Puzzle**

-the equity premium puzzle originates from the observation that equity returns exceeded the risk-free rate to an extent that is consistent with reasonable levels of risk aversion- at least when average rates of return are taken to represent expectations

-Fama and French show that the puzzle emerges primarily from excess returns over the last 50 years; alternative estimates of expected returns using the dividend growth model instead of average returns suggest that excess returns on stocks were high because of unexpected large capital gains

# IV. Applied Portfolio Management

## Portfolio Performance Evaluation

### Conventional theory of performance evaluation

#### Average rates of return

- \***arithmetic return**- best indicator for the next period
- \***geometric, time-weighted average**- gives the cumulative average for the entire period  
-multiply each time period together
- \***dollar weighted return**- internal rate of return; will differ from time weighted return

#### Adjusting returns for risk

- \***comparison universe**- must group similar risk investment together to see what the risk adjusted return actually was, long terms should get better returns than short terms

#### Appropriate performance measures

- methods of risk-adjusted performance evaluation using mean-variance criteria; appeared same time as CAPM

##### 1. Sharpe

- when the portfolio represents the entire investment fund
- divides average portfolio excess return over the sample period by the standard deviation of returns over that period; also measures the reward to (total) volatility trade-off

##### 2. Information ratio

- when the portfolio represents the active portfolio to be optimally mixed with passive portfolio
- divides the alpha of the portfolio by the nonsystematic risk of the portfolio called tracking error in the industry; it measures abnormal return per unit of risk that in principle could be diversified away by holding a market index portfolio

##### 3. Treynor

- when the portfolio represents 1 subportfolio of many
- gives excess return per unit of risk, but it uses systematic risk instead of total risk

##### 4. Jensen

- when the portfolio represents 1 subportfolio of many
- is the average return on the portfolio over and above that predicted by the CAPM, given the portfolio's beta and the average market return; Jensen's measure is the portfolio's alpha value

## 5. M<sup>2</sup>

-like the Sharpe, it focuses on total volatility as a measure of risk, but its risk adjusted measure of performance has the easy interpretation of a differential return relative to the benchmark index

### 2 reasons they don't get used often

1. don't portray positive light for mutual fund managers; confirms underperformance
2. have some intrinsic problems

-many observations are needed to eliminate the effect of the "luck of the draw" from the evaluation process because portfolio returns commonly are very noisy

-alpha is the best measure for portfolio performance measurement

### Performance measurement for hedge funds

-hedge funds should be evaluated based on their information ratio

1. consider the equity portfolio the base
2. then consider the hedge funds which are added in the search for additional alpha, or portable alpha

-hedge funds tend to hold illiquid assets which value determination is difficult; they do this because the investors are locked into their funds for longer

### Performance measurement with changing portfolio composition

-the shifting mean and variance of actively managed portfolios make it even harder to assess performance; a typical example is the attempt of portfolio managers to time the market, resulting in ever-changing beta portfolios

### Market timing

-involves shifting fund between a market-index portfolio and a safe asset, such as T-bills or a money market fund, depending on whether the market as a whole is expected to outperform the safe asset; doesn't happen too often in practice

-a simple way to measure timing and selection simultaneously is to estimate an expanded security characteristic line, with a quadratic term added to the usual index model; implicit call option embedded in their performance

### Style analysis

-regress fund returns on indexes representing a range of asset classes; the regression coefficient on each index then measures the fund's implicit allocation to that style

-uses a multiple regression model where the factors are category (style) portfolios such as bills, bonds, and stocks; a regression of fund returns on the style portfolio returns generates residuals that represent the value added of stock selection in each period; these residuals can be used to gauge fund performance relative to similar style funds

-can be done with excel; use r-squared and p values for comparison

**\*Morning Star Rating method**- compares each fund to a peer group represented by a style portfolio within 4 asset classes; premier source of information on mutual funds

**\*risk adjusted ratings**- based on fund returns relative to the peer group and used to award each fund 1 to 5 stars based on the rank of its RAR

## **2 problems with performance evaluation**

1. many observations are needed for significant results even when portfolio mean and variance are constant
2. shifting parameters when portfolios are actively managed makes accurate performance evaluation all the more elusive

-common attribution procedures partition performance improvements to asset allocation, sector selection, and security selection; performance is assessed by calculating departures of portfolio composition from a benchmark or neutral portfolio



## International Diversification

### **Performance attribution**

1. currency selection
  2. country selection
  3. stock selection
  4. cash/bond selection
- how each aspect contributes to total portfolio performance

## Investment Policy and the CFA

### Making investment decisions

#### 2 factors affecting individual investor return requirements and risk tolerance

1. life-cycle stage
2. individual preferences

#### 7 classes of investors

1. individual investors and personal trusts

\***personal trust**- established when an individual confers legal title to property to another person or institution (trustee) to manage that property for 1 or more beneficiaries

**1. income beneficiaries**- receive the interest and dividend payments from the trust during their lifetimes

**2. remaindermen**- receive the principal of the trust when the income beneficiary dies and the trust is dissolved

-investment strategies will be very conservative

#### 2. mutual funds

-pools of investors' money

#### 3. pension funds

**1. defined contribution plans**- tax deferred retirement savings accounts established by the firm in trust for its employees, with the employee bearing all the risk and receiving all the returns from the plan's assets

**2. defined benefit plans**- the shareholders bear the risk in this plan; largest type; the assets serve as collateral for the liabilities that the firm sponsoring the plan owes to plan beneficiaries; the liabilities are life annuities

#### 4. endowment funds

-organizations chartered to use their money for specific nonprofit purposes

#### 5. life insurance companies

1. whole life- death benefit and cash buildup

2. term life- death benefit with no cash buildup

3. variable life- whole life with options for investments

4. universal life- can reduce or increase death premium at will

-often can borrow against the cash value of the policy

-variable and universal lives are not taxed until the money is withdrawn

#### 6. non-life insurance companies

-property and casualty companies that pay claims after they collect premiums

-can be either a stock or mutual company; just like life insurers

#### 7. banks

-most of their investments are loans to businesses and consumers and most of their liabilities are accounts of depositors

-these groups have different objectives, constraints, and portfolio policies

**Constraints**

1. liquidity
2. investment horizon
  - planned liquidation date
3. regulations
  - prudent investor rule; industry specific regulations
4. taxes
5. unique needs

**Asset allocation****Process****1. specify the asset classes to be included****6 classes**

1. money market instruments (cash)
2. fixed-income securities (bonds)
3. stocks
4. real estate
5. precious metals
6. other

-institutional usually stick to the first 4

**2. define capital market expectations**

-use historical data and economic analysis to determine future rates of return

**3. find the efficient portfolio frontier**

-portfolios with the maxim expected return for a give level of risk

**4. determine the optimal mix**

-taxes significantly influence asset allocation

**Managing portfolios of individual investors**

-people living with fixed-incomes are subject to inflation risk

-the effectiveness of an asset as an inflation hedge depends on its correlation with unanticipated inflation

-taxes have to paid on some investment incomes; complicates matters

-interest income on munis is tax exempt; good for high-tax bracket investors

-capital gains are realized only after the sale of an asset during the holding period; so many investment strategies designed to avoid taxes contradict the principles of effective diversification

**\*life-cycle approach-** views the individual as passing through a series of stages, becoming more risk averse in later years; the rationale underlying this approach is that as we age, we use up our human capital and have less time remaining to recoup possible portfolio losses though increased labour supply

-people buy life and disability insurance during their prime earning years to hedge against the risk associated with their loss of human capital; that is, their future earning power

**4 ways to shelter income from federal income taxes****1. tax-exempt bonds**

**2. tax-deferral option-** invest in assets whose returns that the form of appreciation in value, such as common stocks or real estate; as long as capital gains taxes are not paid until the asset is sold, the tax can be deferred indefinitely

**3. tax-deferred retirement plans-** invest in tax deferred investment plans such as IRAs, Keogh plans; general investment rule is to hold the least-tax advantaged assets in the plan and the most tax-advantaged assets outside of the plan

**4. deferred annuities, fixed or variable-** invest in the tax advantaged products offered by the insurance industry – tax deferred annuities and variable and universal life insurance; they combine the flexibility of mutual fund investing with the tax advantages of tax deferral

### **Pension funds**

#### **1. defined contribution plan**

-retirement funds held in trust for the employee by the employer

-the employees in such plans bear all the risk for the plan's assets and often have some choice in the allocation of assets

#### **2. defined benefit plan**

-give the employees a claim to a money –fixed annuity at retirement

-the annuity level is determined by a formula that takes into account years of service and the employee's wage or salary history

-a policy of 100% tax exempt bonds would both maximize the tax advantage of funding the pension plan and minimize the costs of guaranteeing the defined benefits; financially sound pension sponsor should not invest in equities at all

-equities are not correlated with inflation; therefore, they are a bad hedge against inflation risk for pension sponsors who view their pension liabilities as indexed for inflation

-immunization is a good strategy for pension plans

### **Long run**

1. don't try to out guess the market; keep your money in for the long-run

2. diversify investments to spread risk

3. avoid keeping 401(K) money in company's default plan; low risk, low return

4. don't keep all your money in 1 stock

## Theory of Active Portfolio Management

### Optimal portfolios and alpha values

-alpha values must be shrunk (adjusted toward 0) to account for less-than-perfect forecasting quality; compiling past analyst and forecasts and subsequent realizations allows 1 to estimate the correlation between realizations and forecasts; regression analysis can be used to measure the forecast quality and guide the proper adjustment of future forecasts; when alpha forecasts are scaled back to account for forecast imprecision, the resulting portfolio positions become far more moderate

### 1. Treynor-black model and forecast precision

-these portfolio weights are sensitive to large alpha values, which can result in practically infeasible long/short positions

\***benchmark portfolio risk**- the variance of the return difference between the portfolio and the benchmark, can be constrained to keep the TB portfolio within reasonable weights

1. adjust forecasts for the precision of alpha
2. distribution alpha values
3. organizational structure and performance

### 2. Black-Litterman Model

-this model allows the private views of the portfolio manager to be incorporated with market data in the optimization procedure

1. the covariance matrix from historical data
2. determination of a baseline forecast
3. integrating the manager's private views
4. revisex (posterior expectations)
5. portfolio optimization

-these models are complementary tools; the TB model is more geared toward security analysis while the BL model more naturally fits asset allocation problems

### Value of active management

-even low quality forecasts are valuable; imperceptible R-squares of only .001 in regressions of realizations on analysts' forecasts can be used to substantially improve portfolio performance

# Corporate Finance

## **I. Projects and their Valuation**

The Cost of Capital

The Basics of Capital Budgeting: Evaluating Cash Flows

Cash Flow Estimation and Risk Analysis

Real Options

## **II. Corporate Valuation and Governance**

Financial Planning and Forecasting Financial Statements

Corporate Valuation, Value-Based Management, and Corporate Governance=

## **III. Strategic Financing Decisions**

Capital Structure Decisions

## **IV. Tactical Financing Decisions**

Initial Public Offerings, Investment Banking, and Financial Restructuring

Lease Financing

Hybrid Financing: Preferred Stock, Warrants, and Convertibles

## **V. Operational Hedging**

Working Capital Management

Derivatives and Risk Management

## **VI. Legal Manipulation**

Bankruptcy, Reorganization, and Liquidation

Mergers, LBOs, Divestitures, and Holding Companies

## **VII. Ratio Analysis**

# I. Projects and their Valuation

## The Cost of Capital

### WACC

\***capital components**- common stock, preferred stock, and bonds are the 3 most common types firms employ

\***component cost**- required rate of return on each capital component

\***betas** - are normally found by regressing the returns of a particular company's stock against returns on a stock market index

\***WACC**- weighted average of the various components' costs used to analyze capital budgeting decisions

#### **1. cost of debt= $rd(1-T)$**

-after-tax cost of debt

-marginal cost of new debt=  $rd$ , not the same as the historical, or embedded cost

-flotation adjustments may be needed here as well

#### **2. cost of common stock= CAPM, DCF, Bond-yield**

2 ways to raise equity: 1) directly, by issuing new shares 2) indirectly, reinvesting, retaining earnings

-few mature firms issue new equity: flotation costs can be high, investors see this as a sign of overvalued stock, and the price drops, increase of supply puts pressure on current stock supply

\***opportunity cost**- retained earnings must be utilized so as to earn as much as the owners could by reinvesting themselves;  $r_s$

#### **3. cost of preferred stock= $r_{ps} = \frac{Dps}{Pps}(1-F)$**

- $Dps$  is preferred dividend,  $Pps$  is preferred stock price,  $F$  is flotation costs as a percentage of proceeds

-preferred dividends are not tax deductible, so the company bears their full cost

#### **1. CAPM approach**

$$r_s = r_{RF} + (r_m - r_{RF})b_i$$

\***equity risk premium**- market risk premium, can be estimated using historical or forward looking data

\***risk-free rate**- long term T-bonds

#### **2. DCF approach**

-adds the firm's expected growth rate to its expected dividend yield

$$r_s = \frac{D_1}{P_0} + \text{expected } g$$

$$r_e = D1/P_0(1-F) + g$$

- $r_e$  is greater than  $r_s$

### **Growth rate predictions**

1. historical growth rates
  - historical earnings and dividends
2. retention growth model
  - $g = (1-\text{payout}) \text{ROE}$
3. analysts' forecasts

### **3. Bond yield plus risk premium approach**

-calls for adding a risk premium of from 3 to 5 percentage points to the firm's interest rate on long-term debt

$$r_s = \text{bond yield} + \text{bond RP}$$

-CAPM most widely used

-must use DCF to get flotation costs, and then can add them back to the CAPM or Bond-yield; or could average all 3 together and then add the F from the DCF

**\*target capital structure-** mix of debt, preferred stock, and common equity that minimizes its WACC

$$\text{WACC} = w_{\text{drd}}(1-T) + w_{\text{psrps}} + w_{\text{cers}}$$

### **Factors affecting WACC**

#### **Firm can control**

1. capital structure policy
2. dividend policy
3. investment policy

#### **Firm cannot control**

1. level of interest rates
2. market risk premium
3. tax rates

### **Divisional**

-can have divisional costs of capital for each division

**\*accounting beta method-** betas are normally found by regressing the returns of a particular company's stock against returns on a stock market index; for divisional, just regress division's accounting return on assets against average return on assets for a large sample of firms

**\*pure play method-** find several single-product companies in the same line of business as division being evaluated, and average those companies' betas for the division beta; difficult to do

### **Cost of Capital for Individual Projects**

**\*stand-alone risk-** variability of the project's expected returns; if firm's only asset and if stockholders hold only that 1 stock



**\*corporate, within-firm risk-** variability that the project contributes to the corporation's returns, giving consideration to the fact that the project represents only 1 asset of the firm's assets, hence some of its risk effects will be diversified away; project's effect on firm's earnings variability

**\*market, beta risk-** risk of the project as seen by a well-diversified stockholder; measured by the project's effect on the firm's beta coefficient

-most theoretically relevant, but hardest to measure; all 3 are considered in a judgmental manner

1. determine divisional cost of capital
  2. group divisional projects into subjective risk categories
  3. then, using divisional WACC as starting point, use risk-adjusted costs of capital
- still very subjective method; estimating betas for projects is difficult

-privately held firms present more challenges; generally, add 3% points to liquidity premium and others as well; find similar publicly traded firms and use their betas

#### **4 Mistakes to Avoid**

1. never use the coupon rate on a firm's existing debt as the pre-tax cost of debt
  2. when estimating the market risk premium for the CAPM method, never use the historical average return on stocks in conjunction with the current risk-free rate
- \*historical, current risk premium-** stock return minus T-bond return
3. never use the book value of equity when estimating the target capital structure weights for the WACC
  4. always remember that capital components are funds that come from the investors
- accounts payable and such are not capital components

## The Basics of Capital Budgeting: Evaluating Cash Flows

### Capital Budgeting

- the process of analyzing potential projects; most important managers will make
- these are purely quantitative methods; reason must still be applied

#### 1. NPV

- discounts all cash flows at the project's cost of capital and then sums those cash flows
- accept if NPV is positive; best measure of profitability
- NPV is superior to IRR

#### Caveats

1. if you can't identify why there is positive NPV, there probably isn't
2. positive NPV doesn't just happen; needs hard work
3. some competitive advantages last longer than others; laws and such

#### 2. IRR

- the discount rate that forces a project's NPV to equal 0
- accept if IRR is greater than the cost of capital
- IRR is superior to payback

- the NPV and IRR make the same accept/reject decision for independent projects, but when they are mutually exclusive ranking conflicts can arise
- NPV assumes that cash flows will be reinvested at the firm's cost of capital, while the IRR assumes reinvestment at the project's IRR; reinvestment at cost of capital is better assumption because it is closer to reality
- scale and timing differences can lead to these differences
- multiple IRRs arise when there are nonnormal cash flows
- \***NPV profile**- plots the NPV against the cost of capita;
- the point where its NPV profile crosses the horizontal axis indicates a project's IRR

#### 4. MIRR

- corrects some problems of the IRR
- MIRR involves finding the terminal value TV of the cash inflows, compounded at the firm's cost of capital, and then determining the discount rate that forces the present value of the TV to equal the present value of the outflows

#### 5. Profitability Index

- shows the dollars of PV divided by the initial cost, so it measures profitability

#### 6. Payback Method

- \***payback period**- the number of years required to recover a project's cost

- regular payback method ignores cash flows beyond the payback period, and does not consider the time value of money
- the payback does, though, provide an indication of a project's risk and liquidity, because it shows how long the invested capital will be at risk
- long paybacks mean cash is tied up longer

### **7. Discounted payback method**

- similar to regular payback except it discounts cash flows at the project's cost of capital
- considers time value of money, but ignores cash flows beyond the payback period

### **Mutually exclusive projects with unequal lives**

- necessary to adjust analysis to put projects on an equal-life basis
- only arises for mutually exclusive projects
- issues: inflation, new technology, life estimation is difficult

**1. replacement chain (common life) approach-** analyze both projects using a common life

- extend both projects out

**2. equivalent annual annuity approach EAA-** find the constant payment that has the same NPV as the project's traditional NPV

- use a similar payment, not years

-a project's true value may be greater than the NPV based on its physical life if it can be terminated at the end of its economic life

### **2 complications**

#### **1. increasing marginal cost**

- flotation costs and increased riskiness associated with unusually large expansion programs can cause the marginal cost of capital to rise as the size of the capital budget increases

#### **2 capital rationing**

- occurs when management places a constraint on the size of the firm's capital budget during a particular period
- reluctance to issue new stock, constraints on non-monetary resources, controlling estimation bias

## Cash Flow Estimation and Risk Analysis

### Estimating Cash Flows

-most important and most difficult thing in analyzing a capital budgeting project is estimating the incremental after-tax cash flows the project will produce

\***relevant cash flows**- the specific set of cash flows that should be considered in the decision at hand

\***free cash flow FCF, incremental, net**- additional free cash flow that the company can expect if it implements the project

FCF= investment outlay cash flow + operating cash flow + NOWC cash flow + salvage cash flow

### **Project cash flow**

-project cash flow is different from accounting income; includes:

1. cash outlays for fixed assets
2. the tax shield provided by depreciation
3. cash flows due to changes in net operating working capital

-does not include interest payments

### **Tax laws affect on cash flows**

1. they reduce operating cash flows
2. they determine the depreciation expense that can be taken in each year

### **Incremental cash flow**

1. initial investment outlay
2. operating cash flows over the project's life
3. terminal year cash flows

### **Issues in Project Analysis**

1. purchase of fixed assets and noncash charges
2. changes in net operating working capital
3. interest expenses- not included
4. sunk costs- not included
5. opportunity costs- included
6. externalities- included

-includes cannibalization effect- when a new product reduces existing products' sales; environmental externalities as well

7. replacement projects

-occurs when a firm replaces an existing asset with a new 1; additional from the net effect

8. timing of cash flows

## Depreciation

-straight line, accelerated methods (double-declining balance and sum-of-years' digits); MACRS used widely now

## Inflation

-best procedure is to: build inflation estimates into each cash flow element, using the best available information on how each element will be affected

### 2 ways:

1. leave the cash flows as real rates, and adjust the cost of capital to a real rate
2. leave the cost of capital in its nominal form, and adjust the individual cash flows to reflect inflation

## Risk Analysis: Stand-Alone risk

1. stand-alone risk is easier to measure than corporate risk, far easier to measure than market risk
2. in most cases, all 3 risk measures are correlated; if the economy does well, so does the firm; if the firm does well, so do its projects; because of this correlation, stand-alone risk is a good proxy

**\*beta, market risk-** most relevant risk measure because stockholders are well diversified; beta affects the cost of capital, which in turn affects stock prices

**\*corporate risk-** influences the firm's ability to use low-cost debt, to maintain smooth operations over time, and to avoid crises that might consume management's energy and disrupt its employees, customers, suppliers, and community

-starting point for analyzing a project's stand-alone risk is the uncertainty of cash flows; tight distributions reflect small standard deviations and low risk, while wide distributions reflect great deal of uncertainty and great risk

## Stand-Alone risk assessment techniques

### 1. sensitivity analysis

-most widely used

-technique that shows how much a project's NPV will change in response to a given change in an input variable such as sales, other things held constant

- a. base-case NPV- usual combinations
- b. NPV breakeven- to break even

### 2. scenario analysis

-a risk analysis technique in which the best and worst case NPVs are compared with the project's expected NPV

-base case, worst case, and best case scenarios

### 3. monte carlo simulation

-a risk analysis technique that uses a computer to simulate future events and thus to estimate the profitability and riskiness of a project

**2 methods for incorporating project risk into capital budgeting**

**1. risk adjusted discount rate, project cost of capital-** the rate used to evaluate a particular project; it is based on the corporate WACC, which is increased for riskier projects and decreased for less risky projects

-most often used

**2. certainty equivalent-** every cash flow not known with certainty is scaled down, with the riskier the flow, the lower its certainty equivalent value

**\*decision tree analysis-** shows how different decisions in a project's life affect its value

-used to manage risk through phased decisions

## Real Options

-opportunities are options, the right but not the obligation to take some future action

**\*managerial, strategic, real options**- opportunities to respond changing circumstances, because they give managers the option to influence the outcome of a project;

**\*strategic options**- are often associated with large, strategic projects rather than routine maintenance projects

**\*real options**- they involve real rather than financial assets

### Embedded options

#### 1. investment timing options

-involves not only the decision of whether to proceed with a project, but also when to proceed with it

#### 2. growth option

-occurs when an investment creates an opportunity to make other potentially profitable investments that would not otherwise be possible

-includes options to: expand output, enter a new geographic market, introduce complementary goods or successive generations of products

#### 3. abandonment option

-the ability to abandon a project if the operating cash flows and/or abandonment value turn out to be lower than expected; reduces the risk of a project and increases its value; instead of total abandonment, some options allow a company to reduce capacity or temporarily suspend operations

#### 4. flexibility option

-the option to modify operations depending on how conditions develop during a project's life, especially the type of output produced or the inputs used

### Valuing Real Options

1. DCF valuation ignoring the real option
2. DCF and include a qualitative recognition of the real option
3. Scenario analysis and decision tree analysis
4. standard option pricing model (Black-Scholes)
5. financial engineering

## II. Corporate Valuation and Governance

### Financial Planning and Forecasting Financial Statements

#### Overview of Financial Planning

##### 1. Strategic plans

-usually begin with a statement of corporate purpose

##### 2. Operating plans

-provide detailed implementation to help meet the corporate objectives

##### 3. Financial plans

#### **-5 steps to the financial planning process**

1. project financial statements to analyze the effects of the operating plan on projected profits and financial ratios

2. determine the funds needed for 5 year plan

3. forecast funds to be generated internally and those to be obtained externally: constraints due to debt ratio, current ratio, and coverage ratios

4. establish a performance-based management compensation system that rewards employees for creating shareholder wealth

5. monitor operations after implementing the plan, identify the cause of any deviations, and take corrective actions

#### Sales forecast

-financial forecasting generally begins with a forecast of the firm's sales, in terms of both units and dollars

-can use either the AFN or FFS methods

-both provide different answers, so should use both

#### **1. AFN**

-additional funds needed

AFN = required asset increase – spontaneous liability increase – increase in retained earnings

**-shows external financing depends on 5 key factors**



1. sales growth
  - higher the ratio greater the need for external financing
2. capital intensity
  - higher the ratio greater the need for external financing
3. spontaneous liabilities-to-sales ratio
  - higher the ratio lower the need for external financing
4. profit margin
  - higher the ratio lower the need for external financing
5. retention ratio
  - higher the ratio lower the need for external financing

## **2. FFS**

- forecasted financial statement method
- unlike the AFN, this actually forecasts the financial statements

### **5 steps**

1. analyze the historical ratios
2. forecast the income statement
  - sales, EBIT, interest expense
3. forecast the balance sheet
  - operating assets, current liabilities, items determined by financial policy decisions
4. raise the additional funds needed
5. analysis of the forecast

### **-adjustments can be made if**

1. economies of scale exist in the use of assets
2. excess capacity exists
3. assets may be added in lumpy increments

-linear regression and excess capacity adjustments can be used to forecast asset requirements in situations where assets are not expected to grow at the same rate as sales

## Corporate Valuation, Value-Based Management, and Corporate Governance

### Corporate Valuation Model

\***corporate assets**- operating assets and financial, or nonoperating assets

\***operating assets**- assets-in-place and growth options

\***assets in place**- land, buildings, machines, inventory that the firm uses in its operations to produce products and services

\***growth options**- opportunities the firm has to increase sales; include opportunities arising from R&D expenditures, customer relationships, and the like

\***financial, nonoperating assets**- investments in marketable securities, and noncontrolling interests in the stock of other companies

-value of nonoperating assets is close to the figure reported on the balance sheet

-value of operating assets is the PV of all future cash flows expected from operations when discounted at the weighted average costs of capital

\***terminal, horizon, continuing value**- value of operations at the end of the explicit forecast period; continuing value, equal to the PV of all free cash flows beyond the forecast period, discounted back to the end of the forecast period at the weighted average cost of capital

\***corporate valuation model**- can be used to calculate the total value of a company by finding the value of operations plus the value of nonoperating assets

\***value of equity**- the total value of the company minus the value of the debt and preferred stock

\***price per share**- total value of the equity divided by the number of shares

### Value-Based management

-involves the systematic use of the corporate valuation model to evaluate a company's potential decisions

#### **4 value drivers**

1. growth rate in sales (g)
2. operating profitability OP; NOPAT/sales
3. capital requirements CR; operating capital/sales
4. WACC

\***expected return on invested capital EROIC**- NOPAT/amount of capital available at beginning of year

-a company creates value when  $EROIC - WACC > 0$

### Corporate Governance

\***corporate governance**- manner in which shareholder's objectives are implemented, reflected in a company's actions and policies

## 2 primary mechanisms for corporate governance

1. threat of removal of a poorly performing CEO
2. type of plan used to compensate executives and managers

## 6 ways a manager's behaviour may harm a firm's intrinsic value

1. may not spend enough time maximizing shareholder value, and too much on leisure activities
2. **\*nonpecuniary benefits**- noncash perks like lavish offices, private jets, others; some is cost effective, but some fat is cut after takeovers
3. may not make difficult decisions that would harm friends in the company
4. may take on too much or not enough risk
5. may stockpile cash and not return it to investors
6. may not release all information desired by investors

**\*managerial entrenchment**- likelihood of badly performing managers being removed is low; weak board of directors and strong anti-takeover provisions in company charter

## Internal provisions and features

1. monitoring and discipline by the board of directors
  - \*interlocking board of directors**- when CEO from A sits on B and CEO from B sits on A
2. charter provisions and bylaws that affect the likelihood of a hostile takeover
  - \*targeted share repurchases, greenmail**- occur when a company buys back stock from a potential acquirer at a higher than market price to prevent a takeover
  - \*shareholders rights provisions, poison pills**- allow existing shareholders to purchase additional shares of stock at a lower than market value if a potential acquirer purchases a controlling stake in the company
  - \*restricted voting rights**- provision automatically deprives a shareholder of voting rights if the shareholder owns more than a specified amount of stock
3. using compensation to align managerial and shareholder interests
  - \*stock option**- provides for the purchase of a share of stock at a fixed price, called the exercise price; have an expiration date
4. capital structure and internal control systems
  - \*underinvestment problem**- another agency cost; may not pursue a good project because of fear of failure or loss of job
5. environmental factors outside the firm's control
  - a. regulations and laws
  - b. block ownership patterns
  - c. competition in the product markets
  - d. the media and litigation

**ESOP's**

**\*employee stock ownership plan ESOP-** a plan that facilitates employees' ownership of stock in the company for which they work

**5 reasons to have them**

1. Congress passed enabling legislation
2. represent additional compensation to employees
3. may help the firm retain employees
4. strong tax incentives
5. help being taken over; more stock for voting purposes

# III. Strategic Financing Decisions

## Capital Structure Decisions

### Capital structure issues

-the firm's optimal capital structure is that mix of debt and equity that maximizes the stock price; management always has a target capital structure in mind

### **Factors influencing firm's capital structure**

1. business risk
2. tax position
3. need for financial flexibility
4. managerial conservatism or aggressiveness
5. growth opportunities

- debt increases the cost of stock
- debt reduces the taxes a company pays
- the risk of bankruptcy increases the cost of debt
- bankruptcy risk reduces free cash flow
- bankruptcy risk affects agency costs; underinvestment problem
- issuing equity conveys a signal to the marketplace; informational asymmetry

### Business risk and financial risk

\***business risk**- the risk inherent in the firm's operations if it uses no debt;

### **Factors affecting business risk**

1. demand variability
2. sales price variability
3. input cost variability
4. ability to adjust output prices for changes in input costs
5. ability to develop new products in a timely, cost-effective manner
6. foreign risk exposure
7. operating leverage

-the lower a firm's business risk, the higher its optimal debt ratio

\***operating leverage**- the extent to which fixed costs are used in a firm's operations; a high degree of operating leverage implies a relatively small change in sales results in a large change in ROIC

\***operating break even**- when  $EBIT = 0$

**\*financial risk**- the added risk borne by stockholders as a result of financial leverage

**\*financial leverage**- the extent to which fixed-income securities (debt and preferred stock) are used in its capital structure

### Capital structure theory

-why do all firms, especially in different industries, have different capital structures

#### **1. Modigliani and Miller**

-corporate taxes can help; as well as personal taxes

#### **2. Tradeoff theory**- adds in bankruptcy costs to MM

**\*tradeoff theory of capital structure**- debt is useful because interest is tax deductible, but debt also brings with it costs associated with actual or potential bankruptcy; strike a balance between tax breaks and bankruptcy costs

#### **3. Signalling theory**

-relates to the signals given to investors by a firm's decision to use debt v. stock to raise new capital; a stock issue sets off a negative signal, while debt is at least a neutral signal

-so firms try to maintain a **reserve borrowing capacity** to avoid issuing stock, which means using less debt in normal times than the MM trade-off theory would suggest

-symmetric v. asymmetric information

#### **4. Reserve borrowing capacity**

-in normal times, use more equity and less debt

#### **5. Pecking order hypothesis**

-presence of flotation costs and asymmetric information causes managers to raise capital according to a pecking order

#### **6. using debt to constrain financial managers**

-managers with too much cash could waste it; bond the cash flow, or do an LBO

#### **7. investment opportunity set and reserve borrowing capacity**

-good or bad investment opportunities will determine if they overleverage or not

#### **8. windows of opportunity**

-managers don't believe that markets are efficient, and so look for arbitrage windows

### Estimating the optimal capital structure

1. estimate cost of debt

2. estimate cost of equity

**\*Hamada equation**- shows the effect of financial leverage on beta; firms can take their current beta, tax rate, and debt/equity ratio to arrive at their unleveraged beta

3. estimate WACC

4. estimate firm's value

5. estimate shareholder wealth and stock price

-when debt is risky, management may choose to default on it; if debt is zero-coupon debt, then this makes equity like an option on the value of the firm with a strike price equal to the face value of the debt; if the debt has periodic interest payments, then the equity is like an option, or a compound option

**\*bait and switch-** when a firm has risky debt and equity is like an option, management has an incentive to increase the firm's risk in order to increase the equity value at the expense of the debt value

## Distributions to Shareholders: Dividends and Repurchases

### Level of distributions and firm value

#### Distribution policy has 3 issues

1. level - what fraction of earnings should be distributed
2. form- should the distribution be in the form of cash dividends or stock repurchases
3. stability- should the firm maintain a steady, stable dividend growth rate

**\*target distribution ratio-** % of net income paid out through stock repurchases or cash dividends

**\*target payout ratio-** % of net income paid out as cash dividend

**\*optimal distribution policy-** strikes a balance between current dividends and future growth so as to maximize the firm's stock price

#### 3 theories of investor preference for dividend yield v. capital gain yield

##### 1. dividend irrelevance theory

-a firm's dividend policy has no effect on either the value of its stock or its cost of capital

##### 2. bird-in-the hand theory

-a firm's value will be maximized by a high dividend payout ratio, because investors regard cash dividends as being less risky than potential capital gains

##### 3. tax preference theory

-because long-term capital gains are subject to somewhat less onerous taxes than dividends, investors prefer to have companies retain earnings rather than pay them out as dividends

#### 2 theories to consider when construing dividend policy

##### 1. Clientele effect

-suggests that a firm will attract investors who like the firm's dividend payout policy

##### 2. Signalling- information content of dividends

-investors regard an unexpected dividend change as a signal of management's forecast of future earnings

-dividend paying firms typically follow a policy of steadily increasing dividends; provides investors with stable, dependable income, and departures from it give investors signals about management's expectations for future earnings

### Residual distribution model

-used by most firms to set the long-run target distribution ratio at a level that will permit the firm to meet its equity requirements with retained earnings

#### 2 important points

1. goal is to maximize shareholder value



2. firm's cash flows belong to the investors, so management should not retain unless they have good reason

### **optimal distribution ratio function of 4 factors**

1. investors' preferences for dividends v. capital gains
2. firm's investment opportunities
3. target capital structure
4. availability and cost of external capital

### **4 steps**

1. determine the optimal capital budget
2. determine amount of equity needed to finance the budget given target capital structure
3. use reinvested earnings to meet equity requirements to the extent possible
4. pay dividends or repurchase stock only if more earnings are available than are needed to support the optimum capital budget

distributions = NI – RE needed to finance new investments (target equity ratio \* total capital budget)

### **1. distributions in the form of dividends**

1. estimate earnings and investment opportunities, on average, over the next 5 years
  2. use this forecast and target capital structure to find average residual model distributions and dollars of dividends during the planning period
  3. set a target payout ratio
- use this to help set goals but not as a guide for any 1 year
  - can have a low regular dividend and the supplement it with an extra during good times

### **Dividend payment procedures**

1. declaration date
  - when the payment is made public
2. holder-of-record date
  - when the money transfers hands technically
3. ex-dividend date
  - date when the right to the dividend leaves the shares, 2 days before holder-of-record date
4. payment date
  - when the check is actually mailed

### **2. dividends through stock repurchases**

-a firm buys back some of its outstanding stock, thereby decreasing the number of shares, but *leaving the stock price unchanged*

### **3 situations for stock repurchases**

1. issues debt and buys stock: becomes treasury stock which is a negative on the balance sheet
2. many firms have given their employees stock options, and they repurchase stock to give to their employees when employees exercise the options
3. company may have excess cash

**3 ways to make repurchases**

1. through a broker on the open market
2. firm can make a tender offer to its shareholders; they have a specific amount of shares they want at a specific price for a specified period of time
3. purchase 1 large block on a negotiated basis

**events leading up to a repurchase**

1. sales of a division
2. recapitalization
3. generation of higher than normal cash flows

**Advantages of repurchases**

1. viewed as positive signals, because it means shares are undervalued
2. stockholders have a choice, sell or don't sell; they have to take the dividend
3. dividends are sticky in the short run; so management may use excess cash differently
4. repurchases can be varied from year to year more easily
5. can be used to quickly change capital structure
6. for employee compensation plans to avoid issuing new shares

**Disadvantages of repurchases**

1. stockholders may not be indifferent
2. selling stockholders may not have perfect information
3. may pay too much for the stock

2 more broad categories

**other factors influencing distributions****constraints on dividend payments**

1. bond indentures
2. preferred stock restrictions
3. impairment of capital rule
4. availability of cash
5. penalty tax on improperly accumulated earnings

**availability and cost of Alternative sources of capital**

1. cost of selling new stock
2. ability to substitute debt for equity
3. control

**\*asymmetric information-** reason for joining capital budgeting and capital structure decisions, influences managerial actions in 2 ways

1. managers prefer to use RE as the source of new equity
2. do not want to reduce dividends, so set them artificially low

**Stock splits**

- increases the number of shares outstanding
- normally, splits reduce the price per share in proportion to the increase in shares
- often taken as positive signals and boost the stock price

**firms split their stock when:**

1. the price is quite high

2. management thinks the future is bright

**stock dividends**

-dividend paid in additional shares rather than in cash

-both stock dividends and stock splits are used to keep stock prices within an optimal trading range

**\*dividend reinvestment plan DRIP-** allows stockholders to have the company automatically use dividends to purchase additional shares; DRIPs are popular because they allow shareholders to acquire additional shares without brokerage fees

**2 types**

1. newly issued shares

-raise new capital for the firm

2. old stock already outstanding

-bought via a broker through a bank

## IV. Tactical Financing Decisions

### Initial Public Offerings, Investment Banking, and Financial Restructuring

#### Financial life cycle of a start-up company

-SEC regulates securities markets; IPOs (primary) and secondary markets

\***private placements**- securities offerings to a limited number of investors and are exempt from registration with SEC

\***accredited investors**- include officers and directors of the company, high wealth individuals, and institutional investors; eligible to buy securities in private placements

\***angel**- wealthy individual who makes an equity investment in a start-up company

\***venture capitalists, VC**- managers of a venture capital fund; raise money from investors and make equity investments in start-up companies (portfolio companies)

#### IPO

##### **Advantages of IPO**

1. increases liquidity and allows founders to harvest their wealth
2. permits founders to diversify
3. facilitates raising new corporate cash
4. establishes a value for the firm
5. facilitates merger negotiations
6. increases potential markets

##### **Disadvantages of IPO**

1. cost of reporting
2. disclosure
3. self-dealings
4. inactive market/low price
5. control

#### **Process of going IPO**

##### **1. select an investment bank**

-investment bank, underwriter assist in issuing securities by: helping the firm determine the size of the issue and the type of securities to be issues; establishing the selling price; selling the issue; maintaining an after market for the stock

##### **2. the underwriting syndicate**

- a. best efforts- does not guarantee sales of securities
- b. underwrite- does get a guarantee, because the bank buys the securities and sells them  
-underwriting syndicates (lead, or managing underwriter)
- \***selling group**- still larger issues are accompanied by a group of banks to sell the issue
- \***unsyndicated stock offering**- the managing underwriter, acting alone, sells the issue entirely to a group of institutional investors, thus bypassing both retail stockbrokers and individual investors

### 3. regulation of securities sales

- a. SEC has jurisdiction on all **interstate public offerings** in amounts of 1.5 million or more
- b. newly issued securities (stock and bonds) must be registered with the SEC at least 20 days before public offering
- \***registration statement**- from S-1; provides financial, legal, and technical information about the company to the SEC
- \***prospectus**- embedded in the S-1; summarizes this information for investors
- c. after SEC declares registration effective, new securities may be advertised, but all sales solicitation must be accompanied by the prospectus
- \***preliminary, red herring prospectus**- may be distributed during 20 days before, but no sales may be finalized; contains all pertinent info except final price, which is not finalized until the day before
- d. if the registration statement or prospectus contains any omissions or misrepresentations, they may be sued with severe penalties

### 4. the roadshow and book-building

- after the registration statement has been filed, the team goes on a **roadshow** to push their product; may not disseminate any further information during the SEC mandated **quiet period**; roadshow last 10-14 days in 10-20 cities
- \***book-building**- after each show, the investment takes a tally of interest and build a book for expected # of shares desired; most IPOs are **oversubscribed**, with there being more willing investors than available shares

### 5. first day of trading

- most IPOs are typically underpriced, resulting in first day gains; most IPO sales go to institutional investors and preferred retail customers

#### why underpriced?

- a. the company wants to create excitement with a first day run-up
- b. small % is available to public, so the run-up is not as pronounced as it seems
- c. most plan on future offerings; best way for future success is a successful first day

### 6. costs of going public

- a. spread- typically 7%
- b. lawyer's fees so forth
- c. indirect costs- run-up from the stock on opening day

### 7. importance of secondary market

- investment banks responsibility to ensure liquidity on the secondary market
- physical, dealer or bulletin boards; ending up on the OTC bulletin boards (administered by NASDAQ) would be a failure

### 8. regulating the secondary market

- a. SEC regulates all national stock exchanges

- b. SEC has control over trading by corporate insiders
  - c. SEC can prohibit manipulation by devices such as: 1) pools- large amounts of money used to buy large chunks to artificially inflate prices 2) wash sales- large transactions between members of the same group
  - d. SEC has control over the proxy statement and the way the company uses it to solicit votes
- control over credit requirements for margin requirements and margin calls is by the Federal Reserve Board

### **9. questionable IPO practices**

-many IPOs were underpriced in the 1990s; executives who were issuing a lot of stock for the investment banks got tipped off to 'hot' underpriced IPOs and cashed in

### **Equity carve outs: special IPO**

\*equity carve-out, partial public offering- special IPO where a publicly traded company converts a subsidiary into a separately traded company by selling shares of stock in the subsidiary; parent remains controlling interest of around 80%

advantages

1. facilitate the evaluation of corporate growth opportunities on a line-of-business basis
2. improve the ability of the parent company to offer incentives to the subsidiary's manager
3. increase the effectiveness of capital allocation; internal capital is usually dispersed on political not economic grounds

-IPO fees are higher, more filing costs, underpricing, marketing time wasted

-form of corporate **securitization**, in which the issuance of public securities backed by assets that have been segregated from the remaining assets of the company

### **Non-IPO investment banking activities**

#### **1. preliminary decisions**

- a. dollars to be raised
- b. type of securities issued
- c. competitive bid v. negotiated bid
- d. selection of investment bank

#### **2. private placements**

2 advantages: lower flotation costs and greater speed

#### **3. shelf registrations**

\***SEC rule 415, shelf registration**-allows a company to register an issue and then sell the pieces over time rather than all at once

#### **4. seasoned equity offerings**

-occurs when a public company issues additional shares of stock

### **Going private**

\***leveraged buyout LBO** –when the company goes private through a small group of investors, including management, purchases all of the equity in the company; such deals involve large amounts of debt

#### **Advantages**

1. administrative costs savings

2. increased managerial incentives
  3. increased managerial flexibility
  4. increased shareholder participation
  5. increased financial leverage
- however, lose access to low cost equity and debt

### **Maturity structure of debt**

-after company chooses debt, must choose maturity length

1. maturity matching
2. effects of interest rates levels and forecasts
3. information asymmetries
4. amount of financing required
5. availability of collateral

### **Refunding operations**

-when a bond has a call provision, the entity may refund (call) the bond and issue more at a lower interest rate

#### **Costs of refunding**

1. call premium paid for the privilege of calling the old issue
2. cost of selling new issue
3. tax savings from writing off the unexpensed flotation costs of the old issue
4. net interest that must be paid while both issues are outstanding; new issue is sold prior to ensure available funds

#### **steps**

1. determine the investment outlay required to refund the issue
2. calculate the annual flotation costs tax effects
3. calculate the annual interest savings
4. determine the NPV of the refunding

### **Managing the risk structure of debt**

1. project financing

-the payments on debt are secured by the cash flows of the particular project (Alaska pipeline)

2. securitization

\***security**- refers to a publicly traded financial instrument, opposed to a privately place instrument; thus securities have greater liquidity, which is why there has been a push to securitize many instruments

1. increases their liquidity
2. lowers cost of capital to borrow
3. generally increases efficiency of financial markets

#### **2 ways securitization has occurred**

1. some debt instruments that were formerly rarely traded are now actively traded; due to financial institutions making a market, being willing to buy, sell, and hold an inventory; happened with stocks, bonds, and commercial paper, junk bond market

2. the pledging of specific assets, **asset securitization**, or the creation of **asset-backed securities**

-oldest type of securitization is the mortgage backed bond

1. assets such as mortgages or credit cards are bundled into a pool
2. the financial institution that sold continues as the servicing agent, but investors prosper

**-involves several different institutions**

1. S&L originates the loan
2. investment bank pools the loan and structures the security
3. federal agency might ensure against credit risk
4. second investment bank sells the securities
5. pension fund supplies the final capital



## Lease Financing

### Types of Leases

#### **1. Operating leases**

- a. provide for both financing and maintenance
- b. not fully amortized- lessor won't fully recoup costs
- c. contain a cancellation clause

#### **2. financial, capital leases**

- a. do not provide for maintenance service
- b. are fully amortized
- c. do not contain a cancellation clause

#### **3. sale-and-leaseback arrangements**

-sells the property then simultaneously leases it back

#### **4. combination leases**

-combination lease

#### **5. synthetic leases**

-what Enron and Tyco were doing

- a. set up a SPE- special purpose entity
- b. SPE obtains 97% financing provided by a financial institution and 3% from another entity
- c. SPE uses funds to acquire property, and the corporation leases the property from SPE for 3 to 5 years, with an option to extend
- d. because of the short term of the lease, was deemed an operating lease and did not have to be capitalized on the balance sheets

#### **when lease expired must:**

- a. pay off the SPE's 97% loan
- b. refinance the loan at current interest rates
- c. sell the asset and make up the shortfall

### Tax effects

-if any payment could be considered a lease, firms could benefit with lower taxes

**1. guideline, tax-oriented lease-** the IRS allows the lessor to deduct the asset's depreciation and allows the lessee to deduct lease payments

#### **guidelines**

- a. lease term cannot exceed 80% of useful life
- b. equipment's residual value must be 20% at end of lease term
- c. lessee cannot invest in equipment except through lease payments
- d. leased equipment may not be limited use; must be useable by other parties after terms of lease

**2. non-tax oriented lease-** ownership for tax purposes resides with the lessee rather than the lessor

-the lessee is: the effective owner of the lease, can depreciate it for tax purposes, can deduct only the interest portion of lease payments

**Financial statement effects**

-a lease can be capitalized and shown on the balance sheet, or just shown in the notes (off-balance sheet financing)

**Guidelines for capitalization (at least 1 must be met); Financial Leases; FASB 13**

1. ownership is transferred at end of lease
  2. lessee can purchase the property at less than market value when lease is up
  3. leases that run for 75% or more of the asset's life must be capitalized
  4. PV of lease payments is equal to or greater than 90% of the initial value of the asset
- lease is essentially a loan

**Evaluation by the****1. lessee**

\***net advantage to leasing**- comparison of PV costs of leasing v. PV costs of ownership

- a. estimate cash associated with debt financing; borrowing and buying the asset
- b. estimate cash flows associated with leasing the asset
- c. compare

-must also consider the discount rates for ownership and being provided by the lessor

**2. lessor**

- a. determine the net cash outlay; invoice price of new asset minus advance lease payments
- b. determine periodic cash inflows, minus income taxes and maintenance
- c. estimate after-tax residual value of property when lease expires
- d. determine whether NPV of the lease exceeds 0; whether the rate of return on the lease exceeds the lessor's opportunity cost of capital

\***leveraged lease**- the lessor can improve returns by leveraging debt

**Other issues in leasing**

1. estimated residual value
2. increased credit availability
3. real estate leases
4. vehicle leases
5. leasing and tax laws

**4 major tax factors influencing leasing**

1. investment tax credits- direct write off for purchase of capital equipment
2. depreciation rules
3. tax rates
4. alternative minimum tax AMT

-can reduce corporate profits, thereby reducing AMT and thus total taxes for companies using tax shelters

**Reasons for leasing**

1. tax rate differentials
2. lease in which the lessor is better able to bear the residual risk than the lessee

3. situations where the lessor can maintain the leased equipment more efficiently than the lessee

## Hybrid Financing: Preferred Stock, Warrants, and Convertibles

### **Preferred Stock**

-is a hybrid of debt and equity

#### **Basic Features- “Plain Vanilla”**

1. usually has a par value of \$25 or \$100
  2. dividends are cumulative; can be in arrearages
  3. normally has no voting rights
  4. for the corporation, is less risky than bonds; do not default if don't pay dividends
  5. for the investor, is riskier than bonds; subordinate to bonds
  6. usually is convertible; 50% of the time
  7. some have maturity dates, some don't
  8. most nonconvertible preferred stock is owned by corporations; can take advantage of
  9. preferred dividends are not tax deductible, bond interest is
- 70% of preferred dividends is exempt for corporate investors, so preferreds are good investment choices for corporations

#### **1. Adjustable rate preferred stock ARP**

-have their dividends tied to the rate on Treasury securities

#### **2. Market auction, money market preferred stock**

-low risk, largely tax exempt 7-week maturity security that can be sold between auction dates at close to par

3. MIPS- Modified Income Preferred Securities
4. QUIPS- Quarterly Income Preferred Securities
5. TOPrS- Trust Originated Preferred Stock
6. QUIDS- Quarterly Income Debt Securities

#### **Steps**

1. the issuing corporation establishes a trust, which issues fixed-dividend preferred stock
2. the parent then issues bonds (or debt of some type to the trust), and the trust pays for the bonds with the cash raised from the sale of preferred
3. at this point: the parent has the cash, the trust has the debt, and the public has the preferred stock issued by the trust
4. the parent company then makes interest payments to the trust, the trust makes dividend payments to the investors with the interest payments for the preferred
5. because the parent issued debt and makes interest payments, they are tax deductible

#### **Advantages- Issuer standpoint**

1. payments are not firm commitments
2. avoids dilution of common equity
3. since have no maturity, sinking fund payments are more spread out than for bonds

#### **Disadvantages**

1. after-tax cost of preferred is higher than debt; dividends are not tax deductible
2. dividends are expected to be paid; fixed cost essentially

### **Warrants**

\***warrant**- a certificate issued by a company that gives the holder the right to buy a stated number of shares of the company's stock at a specified price for some specified length of time

- a long term call option issued along with a bond; called a sweetener, usually by smaller startup companies
- warrants are generally detachable from the bond, and they trade separately in the market; when warrants are exercised, the firm receives additional equity capital, and the original bonds remain outstanding

#### **3 conditions to exercise warrants**

1. if warrants are about to expire and the price of the stock is above the exercise price
  2. if the company raises common stock dividend by a sufficient amount
  3. stepped-up exercise price; the exercise price goes up at a certain date
- warrants will impact the price of the bond

### **Convertible securities**

\***convertible security**- a bond or preferred stock that can be exchanged for common stock at the option of the holder

- when a security is converted, debt or preferred stock is replaced with common stock, and no money changes hands
- conversion ratios and conversion prices are very important
- warrant and convertible issues are generally structured so that the strike (exercise) price or conversion price is 20% to 30% above the stock's price at time of issue

#### **2 advantages to issuer**

1. convertibles, like bonds and warrants, offer a company the chance to sell debt with a low interest rate in exchange for giving bondholders a chance to participate in the company's success if it does well
2. provide a way to sell common stock at higher prices; when management thinks prices will go up on their stock

#### **3 disadvantages to issuer**

1. if the stock greatly increases in price, firm would have been better off issuing debt
  2. typically have a low coupon interest rate; and will be lost when conversion takes place
  3. if the company truly wants to raise capital, but the price does not go up, will be stuck with debt
- convertibles can mitigate agency costs relating to taking high risk projects with low interest debt, because the holders can convert to equity to reap in the price jump

-although both warrants and convertibles are option securities, there are several

#### **differences between the 2**

1. separability- warrants can be separated
2. impact when exercised- warrants bring new equity, convertibles just an accounting transfer

3. callability- warrants are not callable, but convertibles are
4. maturity- warrants have shorter maturities
5. flotation costs- more for warrants
6. smaller and riskier firms issue warrants

**Reporting earnings when warrants or convertibles are outstanding**

1. basic EPS
  2. primary EPS- if most of them had been exercised
  3. diluted EPS- all warrants and convertibles had been exercised
- basic and diluted is what is required typically

# V. Operational Hedging

## Working Capital Management

\***working capital**- current assets

\***net working capital**- current assets minus current liabilities

\***net operating working capital**- operating current assets minus operating current liabilities

### Cash Conversion Cycle

\***cash conversion cycle**- focuses on the length of time between when the company makes payments and when it receives cash inflows

#### **4 parts**

**1. inventory conversion period**-  $\text{inventory} / \text{sales per day}$

**2. receivables collection period**- DSO-  $\text{receivables} / (\text{sales}/365)$

**3. payables deferral period**-  $\text{payables} / \text{purchases per day}$

**4. cash conversion cycle**=  $\text{inventory conversion period} + \text{receivables conversion period} - \text{payables deferral period}$

#### **Shortening the CCC**

1. reduce inventory conversion period by processing and selling goods more quickly

2. reduce the receivables collection period by speeding up collections

3. lengthen the payables deferral period by slowing down payments

### Alternative net operating working capital policies

**1. relaxed**- hold large amounts of current assets

**2. restricted**- hold minimal amounts of current assets; more efficient

**3. moderate**- between the 2 extremes

-during times of uncertainty, which is all the time, it is best to maintain some level of safety stock for unexpected occurrences

### Cash management

-primary goal: to reduce the amount of cash needed to conduct business

#### **3 reasons for holding cash**

##### **1. transactions**

-to meet unexpected cash needs

\***transaction balances**- cash necessary to conduct day to day business

\***precautionary balances**- cash reserve held to meet unforeseen needs

##### **2. compensation to banks for providing loans and services**

-must maintain its credit rating

**\*compensating balance**- minimum checking account balance that a bank requires as compensation either for services provided or for part of a loan agreement

### **3. trade discounts**

-to take trade discounts

### **Cash budget**

**\*cash budget**- a schedule showing projected cash inflows and outflows over some period; the cash budget is used to predict cash surpluses and deficits, and is the primary cash management planning tool

-target cash balance

### **Cash management techniques**

#### **1. synchronizing cash flow**

-billing cycles

#### **2. speeding up the check clearing process**

-check clearing process can take several days

#### **3. using float**

**\*float** –the difference between the balance shown in an entity’s checkbook and the balance on the bank’s records

**\*disbursement float**- days gained due to checks written

**\*collections float**- days lost due to checks received

**\*net float**- difference between positive disbursement float and negative collections float

#### **delays causing float**

1. time it takes for checks to travel through the mail (mail float)
2. to be processed by the receiving firm (processing float)
3. to clear through the banking system (clearing, or availability float)

#### **4. speeding up receipts**

1. lockbox plan
2. payment by wire or automatic debit

### **Inventory management**

#### **2 goals**

1. ensure that the inventories needed to sustain operations are available
2. to hold the costs of ordering and carrying inventories to the lowest possible level

#### **3 inventory costs**

1. carrying costs
  - increases with larger inventory
2. ordering costs
  - decreases with larger inventory
3. stock-out costs
  - decreases with larger inventory

### **Receivables management**

**\*account receivable**- created when a firm sells goods to a customer on credit

#### **1. credit policy**



**4 variables**

1. credit period
2. discounts
3. credit standards
4. collection policy

**2. Accumulation of receivables****2 factors**

1. volume of credit sales
2. average length of time between sales and collections

**3. monitoring the receivables position**

1. DSO days sales outstanding
2. aging schedule

**Accruals and accounts payable (trade credit)****1. accruals**

- use them as much as possible, but cannot control them too well: taxes and wages
- increase spontaneously as operations expand

**2. accounts payable (trade credit)**

- largest single category of operating liabilities
- spontaneous source of financing

**3. cost of trade credit**

- stretching of the accounts payable can utilize the trade credit most effectively
- \***free trade credit**- involves credit received during the discount period
- \***costly trade credit**- involves credit in excess of the free trade credit whose cost is an implicit one based on foregone discounts
- should only be used if there are better rates on other investments

**Alternative short-term financing policies**

- \***permanent NOWC**- NOWC the firm holds even during slack times
- \***temporary NOWC**- NOWC the firm holds during seasonal or cyclical peaks
- methods used to finance permanent and temporary NOWC

**1. maturity matching “self-liquidating” approach**

- matching the maturities of assets and liabilities so that temporary NOWC is financed with short-term debt and permanent NOWC is financed with long-term debt or equity

**2. aggressive approach**

- some permanent NOWC, and perhaps even some fixed assets, is financed with short-term debt

**3. conservative approach**

- to use long-term sources to finance all permanent operating capital and some of the temporary NOWC

**Short-term investment: marketable securities**

- firms hold marketable securities to
- 1. reduce risk and transaction costs because it won't have to issue securities or borrow as frequently to raise cash

2. speculative balances to take advantage of growth opportunities or bargains  
-disadvantage is the low yield

### **Short-term financing**

#### **Advantages**

1. speed with which short-term loans can be made
2. increased flexibility
3. short-term interest rates are generally lower than long-term rates

#### **Disadvantages**

-extra risk the borrower must accept because of:

1. the lender can demand payment on short notice
2. the cost of the loan will increase if interest rates rise

### **Short-term bank loans**

#### **1. maturity**

-most bank loans mature in less than a year

#### **2. promissory notes**

5 parts: amount borrowed, % interest rate, repayment schedule, collateral, any other conditions

#### **3. compensating balances**

-deposit requirements set at between 10% to 20% of the loan amount; raise the effective interest rate on loans

#### **4. informal line of credit**

-informal agreement between the bank and the borrower indicating the maximum amount of credit the bank will extend to the borrower

#### **5. revolving credit agreement**

-a formal line of credit often used by big firms; will contain commitment fees or cleanup clauses requiring to reduce the balance to 0 at least once per year

### **Commercial paper**

\***commercial paper**- unsecured short-term debt issued by large, financially strong corporations

#### **1. maturity and cost**

-cost is lower than bank loans, but only big companies can issue it; 1.5 to 3.5 % below prime rate and .5% above T-bill rate

-maturity is from 1 day to 9 months, with 5 month average

#### **2. use of**

-wider range of funding sources, but less room for mistakes or bad fortune

-secured loans will usually be easier to obtain

## Derivatives and Risk Management

### Reasons to manage risk

#### 6 reasons to manage risk, allows firms to

1. debt capacity- increase their use of debt
2. maintain their capital budget over time
3. financial distress- avoid costs associated with financial distress
4. comparative advantages- utilize their comparative advantages in hedging relative to the hedging ability of individual investors
5. borrowing costs- reduce both the risks and costs of borrowing by using swaps
6. tax effects- reduce the higher taxes that result from fluctuating earnings
7. compensation systems

### Background on derivatives

\***derivative** -a security whose value is determined by the market price or interest rate of some other security

\***hedge**- transaction that lowers risk

\***natural hedge**- a transaction between 2 counterparties where the parties' risks are mirror images

### Derivatives in the news

1. LTCM- 33-1 leverage ratio; kind of risky
2. Enron and energy traders
  - hedging is needed in the energy market, because there is no storage; this way, suppliers and consumers can have more stability
  - Enron used these but when energy prices fell they were in trouble; they also overinflated forecasts

### Other types

**1. futures contract**- standardized contract that trades on an exchange, marked-to-market daily, and has no physical delivery of asset

**2. forward contract**- 1 party agrees to buy a commodity at a specific price at a specific future date and the other party agrees to make the sale; delivery does occur

**3. structured note**- a debt obligation derived from another debt obligation

**4. swap**- an exchange of cash payment obligations; occur because 1 party prefers the other's payment stream

-currency swaps, notional principle

#### **2 influences to swap prices**

1. level of interest rates at time of the agreement
2. relative creditworthiness of the 2 companies

#### **5. inverse floater**

-prosper on falling rates; rate paid moves counter to market rates

**Corporate risk management**

-risk management involves the management of unpredictable events that have adverse consequences for the firm

**3 key steps**

1. identify the risks faced by the company
2. measure the potential impact of these risks
3. decide how each relevant risk should be dealt with

**techniques for dealing with risk exposure**

1. transfer the risk to an insurance company
2. transfer the function that produces the risk to a third party
3. purchase a derivative contract
4. reduce the probability of occurrence of an adverse event
5. reduce the magnitude of the loss associated with an adverse event
6. totally avoid the activity that gives rise to the risk

**types of risk**

1. pure risks- offer only the prospect of a loss; fire
2. speculative risks
3. demand risks
4. input risks
5. financial risks
6. property risks
7. personnel risks
8. environmental risks
9. liability risks
10. insurable risks

**Using derivatives to reduce risk**

-hedging is good, speculative reasons is bad

**1. financial futures**

-permit firms to create hedge positions to protect themselves against fluctuating interest rates, stock prices, and exchange rates

**commodity price exposure****2. commodity futures**

-can be used to hedge against input price increases

**security price exposure****A. futures****1. long hedges**

-involve buying futures contracts to guard against the price increases

**2. short hedges**

-involves selling futures contracts to guard against price declines

**3. perfect hedge**

-occurs when the gain or loss on the hedged transaction exactly offsets the loss or gain on the unhedged position

**B. swaps**

# VI. Legal Manipulation

## Bankruptcy, Reorganization, and Liquidation

### Financial distress and its consequences

-the proportion of businesses that fail fluctuates with the economy, but the average liability per failure has tended to increase over time due to inflation and to an increase in the number of billion-dollar bankruptcies in recent years

-fundamental question- is the business worth more dead or alive; can its pieces be sold for better gain than the whole

### **Causes of bankruptcy**

1. economic factors
2. financial factors
3. neglect, disaster, fraud
4. other issues

-ratio analysis can be used to predict when a firm will go bankrupt

### Issues facing a firm in financial distress

1. are financial issues temporary or permanent
2. who gets what
3. dead or alive
4. file Chapter 11 or pursue informal methods
5. who manages during this period

### Settlements without bankruptcy

#### **1. informal reorganization**

\***workouts**- voluntary reorganization plans reserved for companies with temporary financial difficulties; requires restructuring of debt since current cash flows cannot meet current payments

#### **2 parts to restructuring**

\***extension**- creditors postpone the dates of required interest or principal payments, or both; creditors prefer these

\***composition**- creditors voluntarily reduce their fixed claims on the debtor by accepting a lower principal amount, by reducing the interest rate on the debt, by taking equity in exchange for debt, or by some combination

\***adjustment bureau**- organizes the meeting between the firm and the creditors

\***holdout problem**- biggest issue; getting all parties to agree to the voluntary plan

## 2. informal liquidation

-when it is obvious that the firm is worth more dead than alive, informal procedures can liquidate the firm

\***assignment**- an informal procedure for liquidating the firm; usually yields creditors a larger amount than they would have received in a formal bankruptcy liquidation; only feasible if the firm is not too big and complicated

\***assignee trustee**- the third party the assets are transferred to; he then sells them at auction

### Federal bankruptcy law

-current bankruptcy law has 9 chapters

-Chapters 1,3,5 deal with general provisions

-Chapter 9 deals with financially distressed municipalities

-Chapter 12 deals with farms

-Chapter 13 for special adjustments of individuals with normal income

-Chapter 15 sets up the trustees

\***chapter 7**- details the procedures to be followed when liquidating the firm

\***chapter 11**- details procedures for formal reorganization

-petition filed in the bankruptcy court may be either voluntary (by the firm) or involuntary (by the creditors)

### Reorganization in bankruptcy

-the primary role of the bankruptcy court in a reorganization is to determine the fairness and feasibility of proposed plans of reorganization

## 2 problems with informal methods

### 1. common pool

-when 1 creditor can prosper from immediate foreclosure, but the group of creditors prospers from continued operations

\***automatic stay provision**- forced on all creditors in a bankruptcy, limits the ability of creditors to foreclose to collect their individual claims; solution to the common pool problem

\***fraudulent conveyance statutes**- part of debtor-creditor law; protects creditors from unjustified transfers of property by a firm in financial distress

### 2. holdout

-mitigated by the courts

\***cramdown**- when the court mandates a reorganization in spite of dissent; the plan must be deemed fair and equitable to all parties

### Chapter 11 features

1. interest and principal payments are deferred

2. firm can issue debtor-in-possession DIP financing; has seniority over senior debt

3. management gets first right to a reorganization plan

\***absolute priority doctrine**- senior creditors must be paid before juniors receive any money

\***relative priority doctrine**- all claimants get equal treatment

-been more of a shift towards relative; primary effect of this shift is to give firms time to reorganize and provide value for junior claimants

-the primary role of the bankruptcy court in a reorganization is to determine the fairness and feasibility of proposed plans of reorganization

### **Fairness Steps**

1. future sales must be estimated
2. operating conditions analyzed so that future earnings and cash flows can be predicted
3. appropriate capitalization rate must be determined
4. appropriate capital structure after Chapter 11 must be determined
5. reorganized firm's securities must be allocated to the various claimants in a fair and equitable manner

### **Feasibility Steps**

1. debt maturities lengthened, interest rates lowered, and some debt converted into equity
2. new management team if necessary
3. if inventories are obsolete or depleted, they must be replaced
4. plant and equipment may need modernizing
5. may require improvement in production, marketing, advertising, or other functions
6. develop new products or markets
7. labour unions must accept lower wages and less restrictive work rules

**\*insolvent**- when the book values of its liabilities were greater than the market values of its assets

**\*prepackaged pre-pack**- hybrid combining advantages of formal and informal measures  
-firm gets most creditors onboard before filing petition, and then uses a cramdown to get the rest

### **Advantages of**

1. reduction of the holdout problem
  2. preserving creditor's claims
  3. taxes
- immense time (1-2 years), expenses, and groups (5 to 6) that get involved

### **Liquidation in bankruptcy**

-the distribution of assets under Chapter 7 is governed by a specific priority of claims

#### **Chapter 7**

1. provides safeguards against fraud by the debtor
2. provides for an equitable distribution of the debtor's assets among the creditors
3. allows insolvent debtors to discharge all their obligations and start a new business

#### **Priority of claims**

1. past due property taxes
2. secured creditors; specific property
3. legal fees and other expenses to administer the firm
4. expenses incurred after an involuntary case has begun but before the trustee is appointed
5. wages due to employees from 3 months back; 2,000 max per worker
6. claims for unpaid contributions to employee pension plans; 2000 max



7. unsecured claims for customer deposits; 900 max
8. taxes to other government agencies
9. unfunded pension plans
10. general, unsecured creditors
11. preferred stockholders
12. common stockholders

**Other motives**

1. dire future forecasts
  2. hasten settlements in liability suits
- bankruptcies can carry on for long times

## Mergers, LBOs, Divestitures, and Holding Companies

### Rationale for mergers

#### Motives

##### 1. synergy

1. operating economies
2. financial economies
3. tax effects
4. differential efficiency; some aspects of each are better
5. increased market power; reduced competition

##### 2. tax considerations

##### 3. purchase of assets below their replacement costs

##### 4. diversification

##### 5. gaining control over a large enterprise

-manager's personal incentives

##### 6. break up value

-acquiring company takes over the target company

### Types of mergers

#### 1. horizontal

-occurs when 2 firms in the same line of business combine

#### 2. vertical

-combines a firm with 1 of its customer suppliers

#### 3. congeneric

-involves firms in related industries, but where no customer-supplier relationship exists

#### 4. conglomerate

-occurs when firms in totally different industries combine

### Hostile v. friendly takeovers

#### 1. friendly

-management of both firms welcomes the merger

#### 2. hostile

-target firm's management opposes it

#### 2 issues

1. establish a suitable price

2. forms of payment; stocks or bonds

\***operating merger**- the operations of the 2 firms are combine

\***financial merger**- the firms continue to operate separately

## Merger Analysis

### **Key issues to be resolved**

1. price to paid
2. employment/control situation

### **types of analysis**

#### **1. Market Multiple analysis**

- assumes a similar company in the field; ballpark approach
- 2. Corporate Valuation model

#### **3. Free Cash Flow to Equity FCFE model**

- discounted at the cost of equity, not debt

#### **4. Adjusted Present Value APV model**

- incorporates the interest tax shield, which takes into account differences in debt payments

## Structure of takeover

- mergers are accounted for as purchases

\***joint venture**- a corporate alliance in which 2 or more firms combine some of their resources to achieve a specific, limited objective

\***synergistic benefits**- represents the difference between the bid price and the fair market value

### **structure of the bid affects 4 things**

1. capital structure of post-merger firm
2. tax treatment of both acquiring firm target's shareholders
3. ability of the target firm's shareholders to benefit from future merger related gains
4. types of federal and state regulations to which the acquiring firm will be subjected

\***taxable offer**- where the bid is mainly stock

\***nontaxable offer**- where the bid is mainly debt

\***goodwill**- excess of bid price over market value; can be amortized

## Investment bankers' role

### **1. arranging mergers**

### **2. develop defensive tactics**

1. change bylaws so that only 1/3 of the directors are elected each year; or that a 75% approval is needed to approve a majority
2. try to convince the target's firms stockholders the price is too low
3. raise antitrust issues in the hope the Justice Department will intervene
4. repurchase stock in the open market in an effort to push the price above what is being offered by the potential acquirer
5. get a white knight who is acceptable to the target firm's management to compete
6. get a white squire who is friendly to target firm's management to buy enough of the target firm's shares to block a merger
7. poison pills: economic suicide; golden parachutes, stock purchase rights, ESOPs, selling off assets, borrowing at ridiculous terms

### **3. establish a fair value**

**4. finance mergers****5. arbitrage operations****Divestitures**

\***divestiture**- the sale of some of a company's operating assets

**May involve**

1. selling an operating unit to another firm
- 2. spinning off a unit as a separate company**  
-no cash is transferred, just current stockholders get new stock
- 3. carving out a unit by selling a minority interest**  
-generates new cash for management
4. outright liquidation of a unit's assets

**Reasons for divestiture**

1. to settle antitrust suits
2. to clarify what a company actually does
3. to enable management to concentrate on a particular type of activity
4. to raise the capital needed to strengthen the firm's core business

**LBOs**

\***LBO**- a transaction in which a firm's publicly owned stock is acquired in a mostly debt-financed tender offer, a privately owned, highly leveraged firm results; usually the firm's own management initiates the LBO

**Holding companies**

\***holding company**- a firm that owns sufficient stock in another firm to control it; parent company to subsidiaries or operating companies

**Advantages**

1. control can often be obtained for a smaller cash outlay
2. risks may be segregated
3. regulated companies can operate separate subsidiaries for their regulated and unregulated business

**Disadvantages**

1. tax penalties
2. incomplete ownership, if it exists, can lead to control problems

## VII. Ratio Analysis

### Short term liquidity

-working capital- current assets – current liabilities

**Current ratio**= current assets/ current liabilities

**Quick ratio (acid test)**= (cash + net receivables + marketable securities)/ current liabilities

**Cash ratio**= cash + marketable securities/ current liabilities

**Cash to current assets ratio**= cash + marketable securities/ current assets

**Cash flow ratio**= cash flows from operating activities/ current liabilities

### Inventory and Receivables Management Ratios

**Operating cycle**= inventory + receivables

**Cash flow cycle**= inventory + receivables – payables

**Inventory turnover ratio**= COGS/ average annual inventory

**Receivables turnover** = net credit sales/ avg. accounts receivable

**Average collection period**= 365/ receivables turnover (inventory turnover)

**Trend over time**= provision for doubtful accounts/ gross accounts receivable

**Purchases**= cost of sales + EI - BI

**Days of sales in inventory**= avg. inventory/ avg. cost of sales per day

**COGS**- BI + purchases - EI

### Others

-low liquidity index is good, high liquidity- number of days required to convert current assets to cash

\***capital structure**- how a firm chooses to finance its business

\***solvency**- the ability of a company to pay their long-term obligations as they come true

**Financial leverage ratio, equity multiplier**- avg. total assets/ avg. total equity

-financial leverage index greater than 1 is good

-**ROE**= net income – interest and taxes/ avg. total common equity

-**ROA**= net income/ avg. total assets

### Capital Structure and Solvency Ratios

**DFL**= EBIT/ earnings before taxes

**DOL**= CM/ Operating income (EBIT)

**Total debt to total capital**= total liabilities/ total assets

**Total debt to equity capital**= total liabilities/ total equity

**Equity capital to total debt**= total equity/ total liabilities

**Debt-equity ratio**= long-term liabilities/ total equity

**Asset Coverage Ratios**

**Fixed assets to equity capital**= net fixed assets/ total equity

**Net-tangible assets to long-term debt**= total assets- intangible assets- total liabilities/ long-term debt

**Total liabilities to net tangible assets**= total liabilities/ total assets – intangible assets – total liabilities

**Earnings Coverage Ratios**

**Times interest earned**= EBIT/ interest expense

**Earnings to fixed charges**= EBIT + interest applicable to long-term operating leases/ interest expense + interest applicable to long-term operating leases

**Cash flow to fixed charges**= pre-tax operating cash flows + EBIT + interest applicable to long-term operating leases/ interest expense + interest applicable to long-term operating leases

**Return on Invested Capital**

**Return on invested capital**= net income/ avg. invested capital

**Return on invested capital**= net income + interest expense(1-tax rate) + minority interest in income/ avg. total assets

**Return on invested capital**= net income + interest expense(1-tax rate) + minority interest in income / avg. long-term debt + avg. equity

**Return on invested capital**= net income – preferred dividends/ avg. common shareholder's equity

**Dupont Equation**

- end of year values not averages

**Profit margin on sales, return on sales, net income ratio**= net income after interest and taxes/ net sales

**-ROA**= profit margin on sales \* asset turnover ratio

-net income /total assets

**-ROE**= profit margin on sales \* asset turnover ratio \* equity multiplier

**-ROCE**= net income after taxes and interest – preferred dividends/ common equity

**-ROCE**= adjusted profit margin \* asset turnover ratio \* equity multiplier

**Equity growth rate**= net income – preferred dividends – dividend payout/ avg. common stockholder's equity

**Sustainable equity growth rate**= ROCE \* (1 – dividend payout ratio)

**Dividend payout ratio**= cash dividends per common share/ earnings per share

**Return on shareholder's investment**= cash dividends per share + market value of reinvested earnings/ share price

**Affecting probability**= estimates, accounting methods, incentives for disclosure, diversity among users

-source, stability, and trend of revenue

**\*earnings persistence**= a measure of the constancy of earnings over time

\***effective tax rate**= income tax expense/ income from continuing operations before taxes

### Probability Ratios

\***gross profit margin**= net sales – COGS/ net sales

\***book value per share**= stockholder's equity/ # of shares outstanding

\***operating cash flow to income**= cash flow from operating activities/ net income

**Earnings quality**= company's business environment, selection and application of accounting principles, character of management

**Earnings persistence**= earnings variability, earnings trend, management incentives, earnings, management

### Other Ratios

\***price/book ratio**= market price per share/ book value per share

\***PE ratio**= market price per share/ diluted earnings per share

### EPS

\***Income available to common shareholder's (IAC)**= NI- non-cumulative preferred dividends declared – cumulative preferred dividends earned= IAC

\***weighted average number of common shares outstanding(WANSCO)**= average shares

\***basic EPS**= IAC/WANSCO

\***earnings yield**=diluted earnings per share (annual)/ current market price per share

\***dividend yield**= annual dividends per common share/ current market price per share

\***dividend payout ratio**= annual dividend per share/ diluted earnings per share

\***vertical common size financial statement analysis**- compare the performance of different sized companies over a period of time

\***horizontal trend analysis**- comparison of data for a single company or single industry over time

\***current cost accounting**- physical capital maintenance, replacement of capacity used

\***constant dollar or general price level accounting**- financial capital maintenance; general price level index

# III. International Finance

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# I. The International Financial Environment

## Multinational Financial Management

-the MNC utilizes the foreign exchange markets for dividend remittance and financing for its: product markets, subsidiaries, international financial markets

### Managing the MNC

-goal is to maximize shareholder wealth

#### **facing agency problems**

1. parent company
2. corporate control- proxy fight

#### **management structure**

1. centralized
2. decentralized

-combination of both is necessary

### Why Firms Pursue International Business

#### **1. theory of comparative advantage**

- specializing in some products and not making others; trade is necessary

#### **2. imperfect markets theory**

-in perfect markets, international movement is less necessary

-there are costs and often restrictions related to the transfer of labour and other resources used for production

#### **3. product cycle theory**

-firms creates local demand at home; firm exports to accommodate foreign demand; firm establishes foreign subsidiary to establish presence in foreign country and possibly to reduce costs; firm differentiates product from competitors and/or expands product line on foreign country; firm's foreign business declines as its competitive advantages are eliminated

### How Firms Engage in International Business

#### **1. international trade (cash flows from sales)**

-minimal risk; relatively conservative approach

**2. licensing (cash flows from services provided)**

-obligates a firm to provide its technology (copyrights, patents, trademarks, or trade names) in exchange for fees or some other specified benefits

**3. franchising**

-obligates a firm to provide a specialized sales or service strategy, support assistance, and possibly an initial investment in exchange for periodic fees

**4. joint ventures**

-a venture that is jointly owned and operated by 2 or more firms

**5. acquisitions of existing operations (cash flows from remitted earnings)**

-large risk involved, because of large investment; partial investment viable

**6. establishing new foreign subsidiaries**

-requires large investment also

**\*direct foreign investment, DFI-** any method of increasing international business that requires a direct investment in foreign operations

**Valuation Model for an MNC**

-MNC valuation increases when foreign cash flows increase; currencies denominating those cash flows increase; MNC's required rate of return decreases

-domestic model: WACC affects MNCs too (equation)

-valuing international cash flows- 2 currencies and 3 currencies (equation)

**uncertainty surrounding an MNC's cash flows**

1. exposure to international economic conditions
2. exposure to international political risk
3. exposure to exchange rate risk

## International Flow of Funds

### Balance of Payments

\***BOP**- a summary of transactions between domestic and foreign residents for a specific country over a specific period of time

-includes an errors and omissions category too

#### **1. current account**

-summary of the flow of funds between 1 specified country all other countries due to purchases of goods or services, or the provision of income on financial assets

A. merchandise and services

B. factor income – income (interest and dividend payments) received by investors on foreign investments in financial assets (securities) – can go in or out

C. transfers- aid, grants, and gifts from 1 country to another

#### **2. capital account**

-summary of the flow of funds resulting from the sale of assets between 1 specified country and all other countries over a specified period of time

A. value of financial assets transferred across borders by people who move to a new country; nonproduced financial assets transferred across border; patents and trademarks

-small effect

#### **3. Financial account**

-much larger effect than capital accounts

A. DFI- investment in fixed assets in foreign countries that can be used to conduct business operations

B. portfolio investment- long-term financial assets (stock, bond) between countries that do affect the transfer of control

C. other capital investment- short-term financial assets ( money market)

### International Trade Flows

-US has lower % trade of GDP than does Canada and Europe

### International Trade Issues

-events that increase international trade: Berlin wall, single European act 1987, NAFTA 1993, Euro 1999, EU expansion 2004, CAFTA 2003

#### **-trade friction**

-different environmental restrictions, child labour laws, bribes, dumping, tax breaks, exchange rate polices, outsourcing, political and security issues with international trade

### Factors Affecting International Trade Flows

1. inflation- decreases the current account

2. national income- increase in income = decrease in current account

3. government policies- subsidies, tariffs, piracy
  4. exchange rates- strong currency reduces current account if goods are price elastic (sensitive to change)
- factors can interact to offset each other

### **Correcting a Balance-of-Trade Deficit**

--government policies; if other countries buy US securities, then the dollar doesn't go down

#### **why a weak home currency is not a perfect solution**

1. counterpricing by competitors
  2. impact of other weak currencies
  3. prearranged international transactions
- \***J-curve effect**- the lag between weaker dollar and better trade balance (can be due to contracts)
4. Intracompany trade- 50% of all international trade

### **International Capital Flows**

#### **factors affecting DFI**

1. changes in restrictions.
2. privatization
3. potential economic growth
4. tax rates
5. exchange rates

#### **factors affecting international portfolio investment**

1. tax rates on dividends or interest
  2. interest rates
  3. exchange rates
- international capital flows are affected by anything affecting DFI or portfolio investment

### **Agencies that Facilitate International Cash Flows**

1. International Monetary Fund- 1944
  - \***compensatory financing facility CFF**- attempts to reduce the impact of export instability on country economies; developing countries
  - countries pay in quotes; this how much they can borrow
  - \***special drawing rights SDR**- international reserve asset created by the IMF and allocated to member countries to supplement currency reserves; fluctuates with value of major currencies; not a currency but a unit of account
2. World Bank- 1944
  - International Bank for Reconstruction and Development (IBRD); for profit
  - \***structural adjustment loan SAL**- provided to developing countries
  - \***cofinancing agreements**- official aid agencies, export credit agencies, commercial banks
  - \***multilateral investment guarantee agency MIGA**- offers political risk insurance
3. World Trade Organization, WTO
  - GATT 1995- 81 members
4. International Financial Corporation, IFC

- 1956; works to promote private sector growth in countries
- 5. International Development Association, IDA
- 1960; grants loans for countries that cannot get it from the World Bank
- 6. Bank for International Settlement, BIS
- bank of last resort
- 7. Organization for Economic Cooperation and Development
- 30 member countries
- 8. Regional Development Agencies
- many others

## International Financial Markets

### Foreign Exchange Market

-allows for the exchange of 1 currency for another

### **History of foreign exchange**

1. Gold standard

-1876-1913; ended with WWI

2. fixed exchange rates

Bretton woods- 1944

Smithsonian agreement- 1971; dollar was overvalued

3. floating exchange rates

-1973

### **Foreign Exchange transactions**

**\*spot market**- where the majority of foreign exchange transactions occur; at the spot rate at the given time

-happens all over the world, but concentrated in largest banks and London, New York, Tokyo

**\*interbank market**- where banks trade for foreign exchange; 10 brokerage firms handle most of this

-online currency trader Currenex has taken hold as well

-US dollar is official currency of Liberia, Panama, and Ecuador\*\*\*\*

-many countries use the dollar

-trading occurs all over the world at all times of the day

-different currencies have different liquidities

Banks, foreign exchange- competitive quotes, special relationships, speed of execution, advice about current market conditions, forecasting advice

### **Quotations**

Price= amount of US dollars to be converted/price charged by bank per pound

Bid/ask spread= ask rate – bid rate/ ask rate

Factors affecting the spread

1. order cost

2. inventory costs

3. competition

4. value

5. currency risk

**\*direct quotation**- in dollars

**\*indirect quotation**- in foreign currency

### **Forwards/Futures/Options**

\***forward rate**- exchange rate at which to sell or buy currency

\***forward contract**- specifies the amount of a particular currency that will be purchased or sold by the MNC at a specified point in the future at a specified exchange rate

\***currency futures**- specifies a standard volume of a particular currency to be exchange on a specific date

\***currency call option**- provides the right to buy a specific currency at a strike price; hedge future payables

\***currency put option**- provides the right to sell a specific currency at a strike price; hedge future receivables

### **International Money Market**

-includes large banks in many countries

1. European money market- 1960's and 1970s

\***Eurodollars, Eurocurrency market**- dollar deposits in foreign countries

\***petrodollars**- dollars from oil countries; this money then used to lend to oil importing countries; continuous recycling process; like credit

2. Asian money market

-Japan's rates are lowest because they save more

### **Standardized banking regulations**

1. Single European act, EU- 1992

-capital can flow freely though Europe, banks can offer more services in the EU, regulations for taxes, mergers, and competition are similar everywhere, a bank in 1 EU country can go into any other

2. Basel Accord- 1987

-standardized reserve requirements for 12 main countries to 4%;

3. Basel II

-requires more similar collaterals and other things

### **MNC**

1. need to borrow funds to pay in a foreign currency

2. need funds to support local operations; borrow in currency with lower interest rate

**3. borrow in a currency that will depreciate against home currency**

### **Investing**

1. better interest rates

2. appreciation against home currency

### **International Credit Market**

\***eurocredit loan**- loans on 1 year or longer extended by banks to MNCs or government agencies in Europe; eurocredit market

\***LIBOR**- rate used to help float currency issues

\***syndicated loans**- when a group of banks backs the loan, not just 1

-includes more fees, and the banks get better default protection

### **International Bond Market**

-better demand by issuing in a particular country, financing in a specific currency, lower interest rates

-foreign bonds or eurobonds

\***foreign, parallel bond**- issued by a borrower foreign to the country where the bond is placed

\***eurobond market**- sold in countries other than the country of the currency denominating the bonds

-issued in bearer form, annual coupon, convertible, little covenants, other bond features

-US is major denomination

-underwritten by a multinational syndicate of banks and placed in several countries at a time

\***euroclear**- secondary market for Eurobonds

\***Interest Equalization Act IET**- imposed by US in 1963 to discourage US investors from foreign securities; why Eurobond market started

### International Stock Markets

-can enhance global image

-euro has increased offerings

\***Yankee stock offerings**- foreign companies issuing stock in the US; still for their stock market though

\***ADR**- shares representing stock on a foreign exchange

-can list onto an exchange as well

-investors do so as well: economic conditions good in that country, currencies may strengthen, diversify portfolio

-shareholders have more rights in some countries, legal protection of shareholders varies among countries, government enforcement of securities laws varies among countries, corporate corruption varies among countries, degree of financial information that must be provided by the public companies varies among countries

### International crises

1. Asian- 1997

2. Russian- 1998

3. 9/11- 2001

### International investment methods

-direct purchases of foreign stocks, investment in MNC stocks, ADRs, ETFs, IMFs



## Exchange Rate Determination

### **Measuring exchange rate movements**

- can either appreciate or depreciate on a given day
- more volatile for longer time horizons
- are measured by their % change over a specified period, such as a month or a year

### **Exchange rate equilibrium**

- considers the simultaneous demand and supply for a particular currency
- liquidity of the currency affects its equilibrium

### **Factors that influence exchange rates**

- relative inflation, interest rates, and income are the 3 most important
1. relative inflation rates
    - rising inflation in a country will reduce their currency's value
  2. relative interest rates
    - rising interest rates in a country will increase their currency's value
  3. relative income levels
    - rising income will weaken the home currency
  4. government controls
    - impose foreign exchange barriers, foreign trade barriers, intervene ( buy and sell currencies in the market), affect macro variables such as inflation, interest rates, and income levels
  5. expectations
    - for future exchange rates
  6. interaction of factors
    - all factors must be considered simultaneously

## Currency Derivatives

### Forward market

**\*forward contract**- an agreement between a corporation and a commercial bank to exchange a specific amount of currency at a specified exchange rate (forward rate)

-30, 60, 90, 180, and 360 days; 1 million or more

-used to hedge imports; can lock in a rate for future import purchases

-also used to lock in rate at which to sell foreign currency; when needed for conversion purposes

-bid, ask, premium and discount

**\*arbitrage**- forward rates usually differ from spot rates; when they are the same, and the interest rates of 2 countries are different, higher returns can be gained without incurring additional risk

-most of the movements in forward rate is from spot rate, but also due to interest rate differential between the countries

### 2 purposes of forwards

1. offset a forward contract: may need to offset forward contracts when deals fall through

2. forward contract for swap transactions: today and 1 year from now

**\*non-deliverable forward contract NDF**- no currencies exchanged; 1 party just pays the other party based on changes in value

### Currency futures market

**\*currency futures contracts**- contracts specifying a standard volume of a particular currency to be exchanged on a future date

-futures can be traded by anyone, while forwards are between banks and corporations

-Chicago Mercantile Exchange CME, is the biggest market; settlement date is third Wednesday in March, June, September, December: GLOBEX

-futures are standardized and traded on exchanges, while forwards are between banks and individuals, so they can be modified to meet needs

-large corporations use forwards

-pricing futures is similar to forwards

-margin requirements are insisted for futures, because many small investors; no credit risk, because through an exchange

### 2 purposes of

1. purchase futures to hedge payables- when paying with foreign currency in the future

2. sell futures to hedge receivables- when selling the received currency

-can close 1 out by selling an identical contract

### Currency options market

-provide the right to buy or sell currencies at a specified price

-started in 1982

-offered on exchanges and OTC by banks and brokerage firms

-much bigger with financial institutions and can be modified; no credit guarantees

- \*currency call options**- grants the right to buy a specific currency at a designated price within a specified period of time; strike price, monthly expiration dates
- purchased by companies that have payables in currency expected to appreciate
- commonly used to hedge payables and project bids
- purchased by speculators expecting the currency to appreciate
- does not require an obligation, whereas futures do
- some are end of month, and some are European style, can only be exercised at expiration
- in the money, at the money, out of the money

#### **Factors affecting currency call/put option premiums**

1. level of existing spot price relative to strike price
  2. length of time before expiration date
  3. potential variability of currency
- speculators will break even if the revenue from sales is equal to the payments for the currency plus the option premium

**\*currency put options**- the right to sell a currency at a specified price within a specified period of time

- purchased by companies that have receivables in currency expected to depreciate
- purchased by speculators expecting the currency to depreciate

**\*straddle**- purchasing both call and put options; can still be prosperous if there is significant movement

- contingency graphs for currency options can be made to better visually see what exactly is happening

-conditional currency options can be purchased in which the premium is contingent on the actual movement in the currency's value over a specified period of time

#### **European currency options**

- can have slightly lower premiums, but less flexibility
- better for corporations, not for speculators

-boundary conditions and pricing models can help determine the exact price of an option

- long currency straddle (strangle) is buying a call and put (for the firm)
- short currency straddle (strangle) is selling a call and put (for the option writer)

**\*strangle**- similar to currency straddles except the options have different prices

**\*bull spread**- buy a call option and write a call option for a higher price

- hopes for slight currency appreciation; midway between the options

**\*bear spread**- writes a call option and buys a call option for a higher price

- hopes for slight currency depreciation; midway between the options

## II. Exchange Rate Behaviour

### Government Influence on Exchange Rates

#### Exchange Rates Systems

##### 1. Fixed exchange rate system

-exchange rates are either held constant or allowed to fluctuate within very narrow boundaries

-government will devalue or revalue the currency against other countries

**A. Bretton Woods Agreement-** 1944-1971 world rates were fixed according to this; fixed to gold, US dollar was 1/35 ounce; rates could not fluctuate more than 1 percent

**B. Smithsonian Agreement-** US was having BOT deficits, overvalued; US dollar devalued by 8%, currencies could fluctuate by 2.25%, but inconsistencies persisted; by 1973 was done

-future exchange considerations are moot, but government could still alter currency value, and from a macro viewpoint economic conditions in 1 country affect others more

##### 2. freely floating

-exchange rates are determined by market forces without government intervention

-country is more insulated from unemployment and inflation from other countries;

country is more hurt from their own inflation and unemployment

##### 3. managed float

-what most countries have today (dirty float)

-criticism is that governments can manipulate it too much

##### 4. pegged

-the home currency is pegged to a foreign currency or to some unit of account

-it moves in line with that currency against other currencies

-weak economic and political conditions can make the peg not hold

A. Europe's Snake- 1972, didn't work long; few countries

B. European Monetary System- 1979

-similar to snake, just with different specifics

-were tied to the European Currency Unit ECU, within 2.25% or 6% for weak countries

-fell apart in 1992, when Britain and Italy withdrew due to high German interest rates

-1993 boundaries were widened, and led to Euro in 1999

C. Mexico Peso Crisis- 1994

-peso was overvalued and pegged to dollar; central bank bought dollar denominated securities to prevent inflation and buy pesos; when they had to repay the loans, the peso devalued and all the money left....

#### D. China's Peg

-China still pegs low; .12cents from 1996 to 2005

**\*currency board**- used to peg a currency; must have reserves of the pegged currency for logic to dictate

-interest rates will move with the pegged currency; can only peg to 1 currency

**\*dollarization**- the replacement of foreign currency with US dollars; not easily reversed

#### Single European Currency

-1991 Maastricht Treaty called for establishment of a single European currency

-1999 had 9 countries, and by 2002 when all home currency was withdrawn, there were 12 countries

\*European Central Bank is centred in Frankfurt

#### Government Intervention

Reasons for:

1. smooth exchange rate movements

-make business cycles less volatile

2. establish implicit exchange rate boundaries

-many central banks intervene to prevent the currency from falling or rising too much

3. respond to temporary disturbances

#### **1. Direct Intervention**

-either flood market with dollars and exchange for other currencies and depreciate the value, or use foreign currency to buy more dollars and appreciate the value

-as foreign exchange markets have become bigger, central bank intervention has become less effective; reliance on reserves is not as effective

**\*nonsterilized intervention**- when the Fed intervenes in the foreign exchange market without adjusting for the change in the money supply; just exchanging dollars for foreign currencies

**\*sterilized intervention**- when the Fed intervenes in the foreign exchange market and simultaneously engages in offsetting transactions in the Treasury securities market; sells T-bills

-if desire is to strengthen the dollar without affecting the dollar money supply, the Fed exchanges dollars for foreign currencies and sells some of its holding of Treasury securities for dollars

-net effect is an increase in investors' holdings of securities, and a decrease in bank foreign currency balances

-traders can speculate on the timing and extent of central bank intervention

#### **2. Indirect Intervention**

-by influencing the variables which cause dollar fluctuation

-change in home and foreign country inflation, interest rates, and net income, government controls, and expectations of future exchange rates

-government can raise interest rates or issue restrictions on exchange of the currency

**Intervention as a Policy Tool**

-the exchange rate is a tool, like tax laws and the money supply, that the government uses to achieve desired economic objectives

-weak dollar will stimulate economy by reducing US demand for imports and increase foreign demand for US exports; weak dollar reduces US unemployment, but can increase US inflation

-strong dollar can increase US demand for imports, thereby intensifying foreign competition; strong dollar can reduce US inflation but may cause a higher level of US unemployment

-Asian crisis 1997: several countries had to be bailed out by the IMF; Thailand and Indonesia especially

## International Arbitrage and Interest Rate Parity

### International Arbitrage

#### 1. locational arbitrage

- may occur if foreign exchange quotations differ among banks
- normally conducted by banks whose computers can monitor the differences
- must account for bid/ask spread as well

#### 2. triangular arbitrage

- related to cross exchange rates
- \***cross exchange rates**- represent the relationship between 2 currencies that are different from one's base currency: the pound to euro from the dollar's perspective
- a cross exchange rate between 2 currencies is determined by the values of the 2 currencies with respect to a third currency; if the actual cross exchange rate of these 2 currencies differs from the rate that should exist, triangular arbitrage is possible
- like locational arbitrage, triangular arbitrage does not tie up funds; no risk involved because the rates are exact

#### Process

1. buy euros with US dollars
  2. buy pounds with euros
  3. buy dollars with pounds
- must account for bid/ask spread as well

#### 3. covered interest arbitrage

- based on the relationship between the forward rate premium and the interest rate differential
- forwards rates for a currency is determined by the interaction of demand for the contract (forward purchases) and supply (forward sales)
- \***covered interest arbitrage**- the process of capitalizing on the interest rate differential between 2 countries while covering your exchange rate risk with a forward contract "covered" (hedging with the forward contract) "interest arbitrage"
- the size of the premium or discount exhibited by the forward rate of a currency should be about the same as the differential between the interest rates of the 2 countries of concern
- in general terms, the forward rate of the foreign currency will contain a discount if its interest rate is higher than the US interest rate; if the forward premium deviates substantially from the interest rate differential, covered interest arbitrage is possible
- in this type of arbitrage, a foreign short-term investment in a foreign currency is covered by a forward sale of that foreign currency in the future; in this manner, the investor is not exposed to fluctuation in the foreign currency's value

#### Process

1. convert US dollars to pounds and deposit it in a British bank
2. engage in a forward contract to sell pounds in 90 days
3. convert the new pounds to dollars

- may not need the forward contract, but acts as a hedge against currency devaluation
- this is a good idea when interest rates in 1 country are higher than in the US
- this ties up funds however, unlike locational and triangular arbitrage

### **Interest Rate Parity**

- when market forces intervene to ensure that covered interest arbitrage is no longer possible
- IRP states that the size of the forward premium (or discount) should be equal to the interest rate differential between the 2 countries of concern; when IRP exists, covered interest arbitrage is not feasible because any interest rate advantage in the foreign country will be offset by the discount on the forward rate; thus, the act of covered interest arbitrage would generate a return that is no higher than what would be generated by a domestic investment

### **Variables**

1. home currency amount
  2. spot rate of foreign currency
  3. interest rate on foreign deposit
  4. forward rate in dollars for foreign currency conversion
- if the forward premium is equal to the interest rate differential, covered interest arbitrage will not be possible

### **Considerations when assessing IRP**

1. transaction costs
  2. political risk
  3. differential tax laws
- covered interest arbitrage is rarely profitable, so IRP holds up quite well
  - even if it is available, these considerations make profits difficult

-forward premiums across maturity markets- every country has a different long term yield curve



## Relationships among Inflation, Interest Rates, and Exchange Rates

### Purchasing Power Parity PPP

\***PPP**- specifies a precise relationship between relative inflation rates of 2 countries and their exchange rate

\***relative PPP**- prices of the same goods will not be equal because of discrepancies in transportation costs, tariffs, and quotas; accounts for market imperfections

\***absolute PPP**- prices of goods will be the same in all countries; without international barriers, consumers will shift their money to where goods are lower

-suggests that the equilibrium exchange rate will adjust by the same magnitude as the differential in inflation rates between 2 countries

#### **Why it doesn't occur**

##### **1. confounding effects**

-exchange rate movements are not driven solely by inflation; government intervention among other things

##### **2. no substitutes for traded goods**

-if substitute goods are not available domestically, consumers may not stop buying imported goods

-though a valuable concept, there continues to be sizable deviations in the real world

-in the long-run it does hold better than in the short run

### International Fisher Effect IFE

\***IFE**- specifies a precise relationship between relative interest rates of 2 countries and their exchange rates; uses interest rates rather than inflation to explain exchange rate movements

\***Fisher effect**- nominal risk-free rates contain a real rate of return and anticipated inflation

-it suggests that an investor who periodically invests in foreign interest-bearing securities will, on average, achieve a return similar to what is possible domestically; this implies that the exchange rate of the country with high interest rates will depreciate to offset the interest rate advantage achieved by foreign investments

-however, at times this does not hold; thus, investment in foreign short-term securities may achieve a higher return than what is possible domestically; if a firm attempts to achieve the higher return, it also incurs the risk that the currency denominating the foreign security might depreciate against the investor's home currency during the investment period; in this case, the foreign security could generate a lower return than a domestic security, even though it exhibits a higher interest rate

-since it is based on PPP, it does not hold either

**IRP, PPP, IFE**

-PPP theory focuses on the relationship between the inflation rate differential and future exchange rate movements

-IFE theory focuses on the interest rate differential and future exchange rate movements

-IRP theory focuses on the relationship between the interest rate differential and the forward rate premium or discount at a given point in time

-if IRP exists, then it is not possible to benefit from covered interest arbitrage, but investors can still attempt to benefit from high foreign interest rates if they remain uncovered (do not hedge with forward contracts); but the IFE suggests that this strategy will not generate higher returns than what is possible domestically because the exchange rate is expected to decline, on average, by the amount of the interest rate differential

# III. Exchange Rate Risk Management

## Forecasting Exchange Rates

### Why Firms Forecast exchange rates

- MNCs need exchange rate forecasts to
  1. hedging payables and receivables
- forecasts of currency may determine if they hedge
  2. short-term financing
- currency will : 1. exhibit a low interest rate 2. weaken in value over the financing period
  3. short-term investment
- currency will : 1. exhibit a high interest rate 2. strengthen in value over the financing period
  4. capital budgeting
- different currencies may be needed; the capital budgeting analysis must be done in the home currency
  5. long-term financing
- will want a currency that depreciates over time if issuing foreign bonds
  6. earnings assessment
- whether or not a foreign subsidiary's currency will strengthen or weaken will determine whether or not to remit the foreign currency back quickly

### Forecasting techniques

- 1. Technical-** use of historical exchange rate data to predict future values
  - limitations: only reliable for very short periods; not used very often
- 2. Fundamental-** based on fundamental relationships between economic variables and exchange rates
  - inflation, interest rates, income levels, government actions, future expectations

### **Approaches to fundamental forecasting**

1. sensitivity analysis
  - best option
2. regression
  - the lagged regressors may cause issues with regards to instantaneous effects
3. PPP

-PPP specifies the fundamental relationship between the inflation differential and exchange rates; the currency of the relatively inflated country will depreciate by an amount that reflects the country's interest rate differential; according to PPP, the % change in the foreign country's value over a period should reflect the differential between the home inflation rate and the foreign inflation rate over that period  
-but the inflation rates would have to be forecasted, which creates issues

### **Issues with PPP**

1. the timing of the impact of inflation fluctuations on changing trade patterns, and therefore exchange rates, is not known with certainty
2. data used to measure relative prices between 2 countries may be inaccurate
3. barriers to trade can disrupt trade patterns that should emerge in accordance with PPP theory
4. other factors, such as the interest rate differentials between countries, can also affect exchange rates

### **Limitations of Fundamental Forecasting**

1. the precise timing of the impact of some factors on a currency's value is not known; full impact may not occur until 3 or 4 periods later; regression model would need to be adjusted
2. some factors exhibit an immediate impact on exchange rates; forecasts can be difficult to obtain for these factors
3. some factors that need inclusion cannot be easily quantified; labour strikes
4. coefficients derived from regression analysis may not remain constant over time

## **3. Market based**

-process of developing forecasts from market factors: uses spot rate or forward rate

### **1. Spot rate**

-the spot rate represents the market forecast for the currency for the near future, so is a good measure of forecast

### **2. Forward rate**

-the forward rate provides a forecast of the spot rate for that future date

-forward rates are normally available up to 2 to 5 years ahead, but the spread is high because of limited trading

### **IFE and IRP with the forward rate**

-if IRP holds, the forward rate premium reflects the interest rate differential between 2 countries; if the IFE holds, a currency that has a higher interest rate than the US interest rate should depreciate against the dollar because the higher interest rate implies a higher level of expected inflation in that country than in the US

-since the forward rate captures the nominal interest rate (and therefore expected inflation rate) between 2 countries, it should provide more accurate forecasts for currencies in high-inflation countries than the spot rate

### **Reasons firms would not use the forward rate**

1. short term; the spot rate is better
2. may not believe the interest rate differential is influential in the long run

3. if the foreign country's interest rate is similar to the US rate, the forward rate premium or discount will be close to 0, meaning that the forward rate and spot rate will provide similar forecasts

#### **4. Mixed**

- because no single technique is fool proof, a mixture is often used
- different techniques will be weighted differently depending on the currency and timing

#### **Forecasting services**

- Business International, Conti Currency, Predex, Global Insight
- many banks do as well, and they often create multiple forecasts
- often other services can be included with a forecasting service, but is up to the company

#### **Forecast error**

- the longer the time out, the more likely errors will result
- must factor into financial decisions the possibility of errors
- various ways to compute the errors
- these methods can be evaluated by comparing the actual values predicted by the forecasting method; to be meaningful, this comparison should be conducted over several periods

#### **2 evaluation criteria**

##### 1. bias

- can be a positive or negative bias; over or under estimating

##### 2. accuracy

- for example, the Canadian currency has been the most correctly predicted, so one can expect better results when dealing Canadian currency

-when comparing the accuracy of forecasts for 2 currencies, the absolute forecast should be divided by the realized value of the currency to control for differences in the relative values of the currencies

- the efficiency of the markets will also determine how effective forecasts are: EMH

#### **Interval forecasts**

- using intervals increases accuracy; utilize volatility and standard deviation

Methods of estimating exchange rate volatility

##### 1. recent volatility level

##### 2. historical pattern of volatilities

##### 3. implied standard deviation

- derive the ISD from a currency pricing model

## Measuring Exposure to Exchange Rate Fluctuations

### Is exchange rate risk relevant

-MNC's with less risk can obtain funds at lower costs; since they may experience more volatile cash flows because of exchange rate movements, exchange rate risk can affect their financing costs; thus, MNCs may benefit from hedging exchange rate risk

### **Arguments**

#### 1. PPP argument

-exchange rate risk is irrelevant, exchange rate movements are just a response to differentials in price changes between 2 countries, so the exchange rate is offset by the change in prices

#### 2. Investor hedge argument

-exchange rate risk is irrelevant, because the company can hedge best, so investors in MNCs do not need to

#### 3. Currency diversification argument

-exchange rate risk is irrelevant, because the MNC is spread out over many countries; naïve argument

#### 4. Stakeholder diversification argument

-exchange rate risk is irrelevant, because of diversification; naïve argument

### Types of Exposure

-cannot measure exchange rate risk, but can measure exposure to exchange rate fluctuations

#### **1. Transaction exposure**

-exposure of an MNC's future cash transactions to exchange rate movements

-can measure this exposure by determining future payables and receivables positions in various currencies, along with the variability levels and correlations of these currencies; can assess how revenue and costs may change in response to exchange rate scenarios

#### **Steps**

1. estimate net cash flows in each currency

2. measure potential impact of the currency exposure

-includes measurement of: currency variability, currency variability over time, currency correlations, applying currency correlations to net cash flows, and currency correlations over time

3. assess transaction risk based on value at risk (VAR)

\***VAR**- measures the potential maximum 1 day loss on the value of positions of an MNC that is exposed to exchange rate movements

#### **VAR factors**

1. the expected % change in currency for the next day

2. maximum 1 day loss is dependent on the confidence level used; higher confidence level will create a more pronounced 1 day loss, holding other factors constant

3. maximum 1 day loss is dependent on the standard deviation of the daily % change in currency over a previous period

-VAR can be applied to longer time horizons and to a currency portfolio

**Limitations of VAR**

1. assumes normal distribution; if not, losses could be worse
2. assumes volatility (std. deviation) is constant over time; if movements are less volatile in the past than in the future, maximum expected loss will be underestimated

**2. Economic exposure**

- any exposure of an MNC's cash flows (direct or indirect) to exchange rate movements
- can measure this exposure by determining the extent to which their cash flows will be affected by their exposure to each foreign currency

**Transactions subjecting cash flows to economic exposure****Outflows**

1. local sales (relative to foreign competition in local markets)
2. firm's exports denominated in local currency
3. firm's exports denominated in foreign currency
4. interest received from foreign investments

**Inflows**

1. firm's imported supplies denominated in local currency
  2. firm's imported supplies denominated in foreign currency
  3. interest owed on foreign funds
- economic exposure to local currency appreciation, depreciation
  - even purely domestic firms will have economic exposure

**Measuring Economic exposure**

1. sensitivity analysis
2. regression analysis

**3. Translation exposure**

- the exposure of an MNC's consolidated financial statements to exchange rate movements
- to measure this exposure, MNCs forecast their earnings in each foreign currency and then determine how their earnings could be affected by the potential exchange rate movements of each currency

**Does it matter**

1. cash flow perspective
  - the subsidiary could just reinvest those funds unless the parent needs the infusion of funds
2. stock price perspective
  - can affect stock valuation since earnings affect stock price

**Determinants of translation exposure**

1. proportion of business conducted by foreign subsidiaries
2. locations of foreign subsidiaries
3. accounting methods

## Managing Transaction Exposure

### Transaction Exposure

1. must first identify the net transaction exposure on a currency by currency basis
2. can adjust invoice policy to receive payments in the desired currency

### Hedging exposure to payables

1. futures contract
2. forward contract
3. money market hedge
  - a. borrows the home currency and converts the proceeds into the foreign currency that will be needed in the future
  - b. short-term investment in the foreign currency
4. currency option hedge
  - call (to buy) options can be purchased; does not obligate the purchase of the option

### Hedging exposure to receivables

1. futures contract
2. forward contract
3. money market hedge
  - borrowing the currency to be received and using the receivables to pay off the loan
4. currency option hedge
  - put (to sell) options can be purchased; does not obligate the purchase of the option

- future contracts and forward contracts normally yield similar results; forward contracts are more flexible because they are not standardized
- the money market hedge yields similar results to those of the forward hedge if IRP exists
- the currency options hedge have an advantage over the other hedging techniques in that the options do not have to be exercised if the MNC would be better off unhedged; a premium must be paid to purchase the currency options however, so there is a cost for the flexibility they provide
- can hedge some, all, or none of the risk

### Limitations of hedging

#### **1. limitation of hedging an uncertain amount**

- could overhedge or underhedge if quantities ordered are not known for sure

#### **2. limitation of repeated short-term hedging**

- however, the near future is still the best way to hedge because of future uncertainty

### Hedging long-term transaction exposure

#### **1. long-term forward contract**



-long-term hedging can be accomplished through long-term forward contracts that match the date of the payables or receivables  
-not often used until recently; 5 to 10 years

**2. parallel loan**

-involves the exchange of currencies between 2 parties, with a promise to reexchange currencies at a specified exchange rate at a future date  
-interpreted as a loan on the financial statements

**Alternative hedging techniques**

**1. leading and lagging**

-adjusting the timing of a payment request or disbursement to reflect expectations about future currency movements

**2. cross-hedging**

-using a proxy currency when the desired currency cannot be obtained

**3. currency diversification**

-using multiple currencies

**Other hedging techniques**

1. currency strangles
2. currency straddles
3. currency bull spreads
4. currency bear spreads

## Managing Economic Exposure and Translation Exposure

### Economic Exposure

-represents any impact of exchange rate fluctuations on a firm's future cash flows  
 -can be managed by balancing the sensitivity of revenue and expenses to exchange rate fluctuations; but, the firm first must recognize how its revenue and expenses are affected by exchange rate fluctuations

1. can use projected cash flows to assess economic exposure
2. restructuring
  - a. increase or reduce sales in new or existing markets
  - b. increase or reduce its dependency on foreign suppliers
  - c. establish or eliminate production facilities in foreign markets
  - d. increase or reduce its level of debt denominated in foreign currencies

### **Revenue**

-for firms that revenue is most susceptible, their home currency will appreciate against foreign currencies

### **Expenses**

-for firms most worried about expenses, currency will depreciate against foreign currencies

strategies to hedge economic exposure

1. pricing policy
2. hedging with forward contracts
3. purchasing foreign supplies
4. financing with foreign funds
5. revising operations of other units

### Hedging exposure to fixed assets

-could need to hedge fixed assets if they plan on selling them soon

1. date of sale
2. price in local currency

### Managing translation exposure

-occurs when an MNC translates each subsidiary's financial data to the home currency for consolidated financial statements

1. forward contract-can be reduced by selling forward the foreign currency used to measure a subsidiary's income; if the foreign currency depreciates, all will be good; if it appreciates, loss on the forward contract

-most do not want a paper gain that offsets a cash loss

**Limitations**

1. inaccurate earnings forecast

-could be too low or too high, in which case the benefits may not make up for the losses

2. inadequate forward contracts for some currencies

-some currencies are not offered

3. accounting distortions

-translation losses are not tax deductible; whereas gains on forward contracts are used to hedge translation exposure are taxed

4. increased transaction exposure

# IV. Long-term Asset and Liability Management

## Direct Foreign Investment

### Motives for DFI

#### **Revenue related motives**

1. attract new sources of demand
2. enter profitable markets
3. exploit monopolistic advantage
4. react to trade restrictions
5. diversify international

#### **Cost related motives**

1. fully benefit from economies of scale
2. use foreign factors of production
3. use foreign raw materials
4. use foreign technology
5. react to exchange rate movements

### Benefits of international diversification

- can reduce overall risk
- choose international projects that are not correlated over time
- target countries with uncorrelated economies
- must make periodic decisions; is it profitable, should the currency be remitted or kept in the foreign country

### Host government views of DFI

#### **Incentives to encourage DFI**

1. solves unemployment and lack of technology without taking from domestic firms
2. free land. Low interest loans, environmental ease of restrictions, tax breaks, subsidized energy

#### **Barriers to DFI**

1. protective barriers
2. red tape barriers
3. industry barriers
4. environmental barriers

5. regulatory barriers
6. ethical differences
7. political instability
8. government imposed restrictions

## Multinational Capital Budgeting

### Subsidiary v. parent perspective

-the subsidiary's perspective does not consider possible exchange rate and tax effects on a cash flows transaction by the subsidiary to the parent

1. tax differentials

#### **2. restricted remittances**

-country requires a certain percentage remain in the country

#### **3. excessive remittances**

-parent requires a certain percentage

4. exchange rate movements

### Input for multinational capital budgeting

-requires any inputs that will help estimate initial outlay, salvage value, periodic cash flows, and required rate of return on the project

1. initial investment

2. price and consumer demand

3. costs

4. tax laws/ depreciation

5. remitted funds

6. exchange rates

7. salvage (liquidation) value

8. required rate of return

### Factors to consider in multinational capital budgeting

1. exchange rate fluctuations

2. inflation

3. financing arrangements

4. blocked funds

5. uncertain salvage value

6. impact of project on prevailing cash flows

7. host government incentives

8. real options

### Adjusting project assessment for risk

1. risk-adjusted discount rate

-subjective measure

2. sensitivity analysis

3. simulation

### Variation in tax laws among countries

1. corporate income taxes

**2. withholding taxes**

-can be avoided though tax treaties

**3 things taxed**

1. earnings, or dividends remitted to parent
2. interest payments to parent
3. payment for use of patents or trademarks to parent

**3. personal and excise taxes**

4. provision for carrybacks and carryforwards
5. tax treaties
6. tax credits
7. taxes on income from transfer pricing

## International Acquisitions

### Multinational restructuring types

- estimate initial outlay, cash flows, and NPV
- screen targets based on willingness to be acquired and country barriers
- 1. acquisitions
- 2. international partial acquisitions
- 3. acquisitions of privatized businesses
- much more uncertainty
- 4. alliances
- 5. divestitures

### Acquisitions

#### Factors affecting expected cash flow of the foreign target

##### **A. Target specific factors**

- 1. target's previous cash flows
- revenues, expenses, estimated cash flows, future sales price
- 2. managerial talent of target

##### **B. Country specific factors**

- 1. target's local economic conditions
- 2. target's local political conditions
- 3. target's industry conditions
- 4. target's currency conditions
- 5. target's local stock market conditions
- affects private firms as well
- 6. taxes applicable to the target
- \***interaction effects** will present themselves as well; market anticipation will be influenced as well, keep private

### Why valuations of a target may vary

- 1. estimated cash flows of the foreign target
- 2. exchange rate effects on the funds remitted
- 3. required return of acquirer

### Restructuring decisions as real options

#### **1. call option on real assets**

- represents a proposed project that contains an option of pursuing an additional venture

#### **2. put option on real assets**

- represents a proposed project that contains an option of divesting part or all of the project



## Country Risk Analysis

### Why

1. terrorist attacks
2. labour strikes
3. political crises
4. banking systems
5. trade restrictions

### Political Risk Factors

1. attitude of consumers in the host country
2. actions of host government
3. blockage of fund transfers
4. currency inconvertibility
5. war
6. bureaucracy
7. corruption

### Financial risk factors

- economic growth factors
1. interest rates
  2. exchange rates
  3. inflation

### Types of country risk assessment

1. macroassessment  
-political and financial factors
2. microassessment  
-to the particular business of concern

### Techniques to assess country risk

1. checklist approach
2. Delphi technique- surveys
3. quantitative analysis
4. inspection visits
5. combination of techniques

### Comparing risk ratings among countries

\***foreign investment risk matrix FIRM**- displays the financial or economic and political risk from good to bad

### Country risk and capital budgeting

1. adjustment of the discount rate

2. adjustment of the estimated cash flows  
-sensitivity analysis

**Reducing exposure to host government takeovers**

1. use a short-term horizon
2. rely on unique supplies or technology
3. hire local labour
4. borrow local funds
5. purchase insurance
6. use project finance

## Multinational Cost of Capital and Capital Structure

### Cost of capital for MNCs

-can be lower or higher

1. size of firm
2. access to international capital markets
3. international diversification
4. exposure to exchange rate risk
5. exposure to country risk

-can use CAPM

### Cost of capital across countries

#### **A. country differences in the cost of debt**

1. differences in the risk-free rate
2. differences in the risk premium

#### **B. country differences in the cost of equity**

1. strictly an opportunity cost that varies with projects and regions

### Using the cost of capital for assessing foreign projects

1. derive NPVs based on the WACC
2. adjust the WACC for the risk differential
3. derive NPV on the equity investment

### MNC's capital structure decision

#### **A. Influence of corporate characteristics**

1. stability of MNCs cash flows
2. MNC's credit risk
3. MNC's access to retained earnings
4. MNC's guarantee on debt
5. MNC's agency problems

#### **B. Influence of country characteristics**

1. stock restrictions in host countries
2. interest rates in host countries
3. strength of host country currencies
4. country risk in host country
5. tax laws in host countries

-capital structure will need to be revised continuously in response to changing conditions

### Interaction between subsidiary and parent financing decisions

1. increased debt financing by the subsidiary  
-will use less internal financing and remit more funds to parent
2. reduced debt financing by the subsidiary  
-will use more internal funds and remit less to parent

**Local v. global capital structure**

-the parent will have to offset increased financial leverage by the subsidiary with its own financing

## Long-term Financing

### Long-term financing decision

- long-term financing in foreign currency offsets future cash inflows in that currency and reduces exchange-rate risk; can also reduce financing costs
- sources of debt and equity will be abundant, as with domestic operations

### Exchange rate risk of debt financing

#### To Assess

1. exchange rate probabilities
2. simulations

#### Reducing exchange rate risk

1. offset cash inflows
2. forward contracts
3. currency swaps
4. parallel loans
5. diversifying among currencies

\***currency cocktail bond**- financed with several different currencies

### Interest rate risk from debt financing

-bonds with floating interest rates represent another issue

1. debt maturity decision
2. fixed v. floating rate decision
3. hedging with interest rate swaps
  1. plain vanilla- standard contract with no extra provisions
  2. accretion swap- the notional value is increased over time
  3. amortizing swap- opposite of accretion swap; notional value decreases over time
  4. basis (floating-for-floating) swap- exchange of 2 floating rate payments; 1 year LIBOR for 6 month LIBOR
  5. callable swap- gives the fixed rate payer the option to terminate the swap; if interest rates fall
  6. forward swap- interest rate swap entered into today, but payments don't start until a future date
  7. puttable swap- gives the floating rate payer the option to terminate the swap if interest rates rise
  8. 0-coupon swap- all fixed interest payments are postponed until maturity and are paid in 1 lump sum when the swap matures; the floating rate payments are still due periodically
8. swaption- gives the owner the right to enter into a swap; the exercise price of a swaption is a specified interest rate at which the swaption owner can enter the swap at a specified future date

\***payer swaption**- gives the owner the right to switch from paying floating to paying fixed interest rates at the exercise price

**\*receiver swaption-** gives the owner the right to switch from receiving floating rate to receiving fixed rate payments at the exercise price

**International Swaps and Derivatives Association ISDA-** standardizes over 600 institutions in 48 countries; began in 1985; regulates interest rate, currency, commodity, credit, and equity swaps, collars, floors, caps, and swaptions

**\*ISDA master agreement-** provides participants in the private derivatives market with a rather standardized contract

# V. Short-term Asset and Liability Management

## Financing International Trade

### Payment methods for international trade

#### 1. prepayment

-pay before the goods are shipped

#### 2. letters of credit L/C

-instrument issued by a bank on behalf of the importer promising to pay the exporter upon presentation of shipping documents in compliance with the terms; the bank substitutes its credit for the buyer

#### 3. drafts, bill of exchange

-unconditional promise drawn by 1 party, usually the exporter, instructing the buyer to pay the face amount upon presentation; bank's are not obligated

\***documentary collections**- banks act as intermediaries for payment and pickup

\***documents against payment**- must be presented to gain shipping papers which gains access to the goods

\***documents against acceptance**- buyer must pay at a future date

\***trade acceptance**- buyer is able to obtain the merchandise before paying for it

#### 4. consignment

-the exporter shipped the goods but still retains the title; does not get paid until a third party buys the goods

#### 5. open account

-credit

### Trade finance methods

#### 1. accounts receivable financing

-credit

#### 2. factoring

-selling accounts receivable to a third party

-cross border factoring can also be used

#### 3. letters of credit L/C

\*commercial L/C-

\*import/export L/C-

\***revocable L/C**- can be cancelled or revoked at any time without prior notification to the beneficiary; seldom used

\***irrevocable L/C**- cannot be cancelled or amended without the beneficiary's consent

\***issuing bank**- issuing bank

\***advising bank**- correspondent bank

\***draft, bill of exchange**- can be for sight or time

-bill of lading, commercial invoices

\***standby L/C**- promises to pay beneficiary if the buyer fails to pay; governments use these; not funded if the payment goes normal

\***transferable L/C**- allows the beneficiary to transfer all or part of the L/C to a third party

\***assignment of proceeds**- the original beneficiary of the L/C pledges or assigns the proceeds from the L/C to the end supplier

#### **4. banker's acceptances**

-is a time draft, or bill of exchange, drawn on and accepted by a bank

\***all in rate**- the discount rate plus the banker's commission

#### **5. working capital financing**

-financing for selling the goods as well

#### **6. medium-term capital goods financing (forfaiting)**

\***forfaiting**- the purchase of financial obligations for expensive capital equipment by a bank

#### **7. countertrade**

-all types of foreign trade transactions in which the sale of goods from 1 country is linked to the purchase of goods as well

-barter, compensation, counterpurchase

### **Agencies that motivate international trade**

#### **1. Export-Import Bank of the US**

-began in 1934 to help facilitate US-Soviet trade

##### **1. guarantees**

\***Working capital guarantee program**- guarantees 90-100% of principal and interest for commercial banks to loan

\***Medium-term guarantee program**- for capital goods; 100% guarantee but cannot exceed 85% of contract price; 1-5 years

##### **2. loans**

\***direct loan program**- extends fixed rate loans to foreign buyers

\***project finance loan program**- long-term financing

##### **3. bank insurance**

\***Bank letter of credit policy**- enables banks to confirm L/C issued by foreign banks supporting a purchase of US exports

\***Financial institution buyer credit policy**- issued in the name of the bank; provides insurance coverage for loans by banks to foreign buyers on a short-term basis

##### **4. export credit insurance**

\* small business policy- provides enhanced coverage to new exporters and small businesses

\***umbrella policy**- issued to an administrator (bank), who then uses it for several clients

\***multibuyer policy**- coverage on short-term export sales to many different buyers



**\*single-buyer policy**- allows an exporter to selectively insure certain short-term transactions to preapproved buyers

**2. Private Export Funding Corporation PEFCO**

-owned by a consortium of commercial banks and industrial companies

**3. Overseas Private Investment Corporation OPIC**

-federal agency that insures investments against economic and country risks

## Short-term Financing

### **Sources of short-term financing**

1. short-term notes
  2. commercial paper
  3. bank loans
- internal financing by MNCs can be an option

### **Foreign financing by MNCs**

1. foreign financing to offset currency inflows
2. to reduce costs

### **Determining the effective financing rate**

-depends on:

1. interest rates
2. currency movement of borrowed currency

### **Criteria considered for foreign financing**

1. interest rate parity
2. forward rate as a forecast
3. exchange rate forecasts

-get portfolio diversification effects from financing with a portfolio of currencies

## International Cash Management

### **Multinational management of working capital**

1. subsidiary expenses
  2. subsidiary revenue
  3. subsidiary dividend payments
  4. subsidiary liquidity management
- centralized cash management or decentralized

### **Techniques to optimize cash flow**

1. accelerating cash inflows
  - lockboxes, float, prepayments
2. minimizing currency conversion costs
  - net transactions to once per month
3. managing blocked funds
  - can use that subsidiary for things such as R&D; each one specializes to its characteristics
4. managing intersubsidiary cash transfers
  - leading and lagging

### **Complications in optimizing cash flow**

1. company-related characteristics
2. government restrictions
3. characteristics of banking systems

### **Investing excess cash**

1. centralize cash
  2. determine the effective yield
  3. interest rate parities
  4. use the forward rate as a forecast
  5. exchange rate forecasts
  6. diversify cash across currencies
  7. dynamic hedging
- directional investing; risky

# IV. Financial Instruments

## **I. Securities and their Valuation**

Bonds, Bond Valuation, and Interest Rates

Risk, Return, and Capital Asset Pricing Model

Portfolio Theory and Other Asset Pricing Models

Stocks, Stock Valuation, and Stock Market Equilibrium

Financial Options and Applications in Corporate Finance

## **II. Fixed Income Securities**

Bond Prices and Yields

The Term Structure of Interest Rates

Managing Bond Portfolios

## **III. Security Analysis**

Macroeconomic and Industry Analysis

Equity Valuation Models

Financial Statement Analysis

## **IV. Options, Derivatives, and Futures**

Options Markets: Introduction

Option Valuation

Futures Markets

Futures and Swaps: Markets and Applications

## **V. Classes of Financial Instruments**

## **Classes of Financial Instruments**

### **A. Vanilla Options**

#### **Vanilla options**

- 1) option styles
- 2) call
- 3) put
- 4) warrants
- 5) fixed income
- 6) employee stock
- 7) FX
- 8) bond option

### **B. Exotic Options**

#### **Exotic options**

- 1) Asian
- 2) lookback
- 3) barrier
- 4) binary
- 5) forward start option
- 6) cliquet
- 7) mountain range
- 8) rainbow option
- 9) compound option

### **ABI. Options Strategies**

#### **Options strategies**

- 1) covered call
- 2) naked put
- 3) collar
- 4) straddle
- 5) strangle
- 6) butterfly
- 7) iron condor

### **ABII. Options Spreads**

#### **Options spreads**

- 1) bull spread
- 2) bear spread
- 3) calendar spread
- 4) vertical spread
- 5) debit spread
- 6) credit spread

**ABIII. Valuation of Options****Valuation of options**

- 1) moneyness
- 2) option time value
- 3) put-call parity
- 4) black-scholes
- 5) black
- 6) binomial
- 7) simulation

**C. Swaps****CI. Valuation of Swaps****Swaps**

- 1) interest rate swap
- 2) total return swap
- 3) equity swap
- 4) forex swap
- 5) currency swap
- 6) constant maturity swap
- 7) basis swap
- 8) volatility swap
- 9) variance swap
- 10) credit default swap

**D. Derivatives****DI. Valuation of Derivatives****Derivatives**

- 1) Equity derivative
- 2) fund derivative
- 3) credit derivative
- 4) CPPI-
- 5) interest rate derivative
- 6) inflation derivative
- 7) real estate derivatives
- 8) PRDC
- 9) futures contract
- 10) ELN
- 11) CLN

# I. Securities and their Valuation

## Bonds, Bond Valuation, and Interest Rates

### Characteristics of bonds

-treasury, corporate, municipal, foreign

\***par value**- stated face value of the bond

\***coupon payment**- interest payment

\***coupon interest rate**- coupon divided by par value

\***floating rate**- coupon varies over time

\***zero-coupon**- no coupon

\***original issue discount OID**- issued for less than original price

\***payment-in-kind PIK**- coupon is a percentage on a new bond

\***maturity date**- when the par value must be repaid

\***original maturity**- usually 10 – 40 years, but any length is legally permissible

-call provision, call premium, deferred call, call protection

\***refunding operation**- buying the old bonds and issuing new ones at better rates

\***redeemable at par**- regardless of interest rates rise, investors can redeem the bonds at their par value

\***super poison put**- minimizes event risk; enables a bondholder to put a bond back to the company in the event of a takeover, merger, or major recapitalization

\***make-whole call**- allows the company to call it, but they must pay a price similar to the market value of other bonds

-convertibles, warrants, sinking funds, income, and index or inflation bonds

### Valuation of

-is the present value of its expected cash flows

\***discount**- when interest rates rise and the value of the bond falls

\***premium**- when interest rates rise and the value of the bond rises

### Yields

\***yield to maturity**- bought the bond and held it to maturity

\***yield to call**- when interest rates fall below the bond's coupon

\***current yield**- annual interest payment divided by the bond's current price

-new issues and seasoned issues, or outstanding issues

$r_{t\text{-bill}} = r_{RF} = r^* + IP$  (inflation premium)

\***nominal, risk-free rate**- real risk free rate plus a premium for expected inflation

$r_d = r_{RF} + DRP + LP + MRP$

- \***liquidity premium**- more liquid assets have a lower premium
- \***maturity risk premium**- interest rate risk and reinvestment risk
- \***interest rate risk**- risk of decline in bond values due to rising interest rates
- \***reinvestment risk**- risk of an income declining due to a drop in interest rates
- \***default risk premium**- for the possibility of default; several influences

### **Bond contract provisions that influence default risk**

1. bond indentures- legal document with trustee (bank) and restrictive covenants
2. mortgage bonds-certain assets pledged
3. debentures and subordinated debentures- unsecured bond
4. development bonds- development or pollution control
5. munis bond insurance

### **Bond ratings factors**

1. various ratios
2. mortgage provisions
3. subordinated provisions
4. guarantee provisions
5. sinking fund
6. maturity
7. stability
8. regulation
9. antitrust
10. overseas protection
11. environmental factors
12. product liability
13. pension liabilities
14. labour unrest
15. accounting policies

\***bond spread**- the difference between a bond's yield and the yield on some other security of the same maturity

\***term structure of interest rates**- the relationship between long and short term interest rates

\***yield curve**- the set of data for a given date

-normally upward sloping (normal yield curve); also could be inverted

\***humped**- medium term rates are higher than either short or long term rates

-shape depends on 2 factors: expectations about future inflation; perceptions about the relative risk of securities with different maturities

\***pure expectations theory**- large bond traders dominate the market; they are just as likely to buy and sell 30 year or 3 month bonds if they can make a profit



## Risk, Return, and Capital Asset Pricing Model

### Stand-Alone Risk

2 ways to analyze risk: 1) in isolation 2) within a portfolio

\***probability distribution**- all possible events and their probabilities

-the tighter the probability distribution, the lower the risk assigned to the stock

-stand-alone risk, expected rate of return

3 ways to measure stand-alone risk: standard deviation, realized rate of return, coefficient of variation

\***standard deviation**- the smaller the standard deviation, the tighter the probability distribution, and accordingly, the less risky the stock

\***realized rate of return**- the past historical returns

\***coefficient of variation CV**- standard deviation divided by the expected return; shows the risk per unit of return, and it provides a more meaningful basis for comparison when the expected returns on 2 alternatives are not the same

### Risk in a Portfolio Context

-the risk of the security doesn't matter; the overall risk of the portfolio does

\***correlation coefficient**- measures the tendency of 2 variables to move with each other

-diversification does nothing to reduce risk if the portfolio consists of perfectly correlated stocks

\***market portfolio**- consists of all stocks; has a standard deviation of about 20%

-thus, almost half the inherent risk in individual stock can be eliminated in a portfolio with at least 40 stocks

\***CAPM**- used to analyze the relationship between risk and return; the relevant risk of an individual stock is its contribution to the risk of a well-diversified portfolio

-ex ante model; all the variables represent before the fact, expected values

\***relevant risk**- its contribution to the risk of a well-diversified portfolio

\***inherent risk**- risk that is apparent in the market

\***beta coefficient**- the relevant risk of an individual stock; measures the extent to which a stock's returns move relative to the market

-the beta of a portfolio is the weighted average of the betas of the individual stocks in the portfolio

-a high beta stock is more volatile than a low beta one; average  $b = 1$

\***security market line SML**- the relationship between the required return and risk

\***market risk premium**- the premium investors require for bearing the risk of an average stock; it depends on the degree of risk aversion that investors on average have

-inflation is the same as rent on borrowed money, or the price of money

3 things can cause the required rate of return to change- 1) risk-free rate can change because of changes in either real rates or anticipated inflation 2) a stock's beta can change 3) investor's aversion to risk can change

## Portfolio Theory and Other Asset Pricing Models

### Efficient Portfolios

- \***efficient portfolios**- those that provide the highest expected return for any degree of risk, or the lowest degree of risk for any expected return
- the feasible set of portfolios is that which represents all portfolios that can be constructed for a given set of assets
- \***optimal portfolio**- the investor's highest possible indifference curve that is tangent to the efficient set of portfolios
- efficiency frontier and indifference curve

### CAPM

- single factor model
- describes the relationship between market risk and required rates of return
- CML, SML
- \***characteristic line**- slope of this line measures the beta; found by regressing historical returns on the stock against historical returns on the market

### **CAPM assumptions**

1. all investors focus on a single holding period, and they seek to maximize the expected utility of their terminal wealth by choosing among alternative portfolios on the basis of each portfolio's expected return and standard deviation
  2. all investors can borrow or lend an unlimited amount at a given risk-free rate of interest, and there are no restrictions on short sales of any asset
  3. all investors have identical estimates of the expected returns, variances, and covariances among all assets (investors have homogenous expectations)
  4. all assets are perfectly divisible and perfectly liquid (marketable at the going price)
  5. there are no transaction costs
  6. there are no taxes
  7. all investors are price takers (all investors assume that their own buying and selling activities will not affect stock prices)
  8. the quantities of all assets are given and fixed
- total risk = variance = market risk + diversifiable risk

- \***adjusted beta**- adjusts for beta closer to 1 and provides a better indication of future beta
- \***fundamental beta**- constantly adjusted to control for current financial leverage, sales volatility, and the like

### **3 risk-adjusted performance measures**

1. **Jensen's alpha**- the intercept in a CAPM regression of excess returns
2. **Sharpe ratio**- the portfolio's average return divided by its standard deviation
3. **Treynor's reward-to-volatility ratio**- the portfolio's average return divided by its beta

**Fama-French 3 Factor**

-multi-factor model

-includes: market return, size effect, and book-to-market ratio

**Arbitrage Pricing Model**

-multi-factor model

-can include many variables; uses factor analysis

\***factor analysis**- start with hundred of different stocks and portfolios and withdraw several factors from them

\***behavioural finance**- assumes that investors do not always behave rationally

## Stocks, Stock Valuation, and Stock Market Equilibrium

### Legal Rights and Privileges of Common Stockholders

\***closely held**- common stock is not actively traded; owned by a few people; publicly held

\***proxy**- document that gives 1 person the right to act for another proxy fights, and preemptive rights, takeovers

### Types of common stock

\***classified stock**- used to meet different needs of the company; different classes of stock depending on voting rights and dividends

\***founder's shares**- owned by the firm's founders and carries sole voting rights but restricted dividends for a number of years

\***tracking, target stock**- used to tie performance of a part company to dividends

### Stock Valuation Methods

\***intrinsic value**- the present value of the stream of dividends the stock is expected to provide in the future

-includes the dividend yield, rate of return, and growth rate

#### **1. constant growth**

- $P_0 = D_1 / (r_s - g)$

#### **2. zero-growth**

-future dividends are not expected to grow at all

- $P_0 = D / r_s$

#### **3. supernormal growth**

-earnings and dividends grow really fast for a period and then level off

4 steps: 1) find the dividends expected during the supernormal growth period 2) find the price of the stock at the end of the supernormal growth period 3) discount the dividends and the projected price back to the present 4) sum these PVs to find the current intrinsic, or expected value, of the stock,  $P_0$

\***horizon (terminal) date**- the date when individual dividend forecasts are no longer made because the dividend growth rate is assumed to be constant

\***horizon (terminal) value**- the value at the horizon date of all future dividends after that date

#### **4. Free cash Flow**

-PV of future expected free cash flows, discounted at the WACC

$V = FCF (1 + g) / (WACC - g)$

#### **5. market multiple analysis**

-applies a market-determined multiple to NI, EPS, BV, or other

-more judgmental of a technique; get the average for market and the company's forecast and multiply together

\***entity multiple**- EBITDA, something to use for the market multiple analysis

**\*preferred stock**- hybrid security having some aspects of equity and some of debt; most are perpetuities

$$V = D/r$$

**\*maturing preferred stock**- evaluated with a formula that is identical in form to the bond valuation formula

**\*marginal investor**- a representative investor whose actions reflect the beliefs of those people who are currently trading a stock; the marginal investor determines the stock price

**\*equilibrium**- the condition under which the expected return on a security as seen by the marginal investor is equal to its required return; the stock's intrinsic value must also equal its market price

### **Efficient Markets**

2 assumptions: 1) stocks are always in equilibrium 2) it is impossible for an investor who does not have inside information to consistently beat the market

-therefore, stocks are always fairly valued and the required return on a stock is equal to its expected return, and all stocks' expected returns plot to the SML

**1. weak form**- all information contained in past price movements is fully reflected in current market prices

**2. semi-strong form**- current market prices reflect all publicly available information

**3. strong form**- current market prices reflect all pertinent information, whether public or private; would make it impossible to earn returns in stock market

## Financial Options and Applications in Corporate Finance

### Financial Options

\***option**- a contract that gives the holder the right to buy or sell an asset at some predetermined price within a specified period of time

-based on the premise of a riskless hedge; options should be able to hedge any risk  
-instruments that are: 1) created by exchanges rather than firm 2) are bought and sold primarily by investors 3) important to investors and financial managers

\***American option**- can be exercised any time before the expiration date

\***European option**- can only be exercised on the expiration date

\***covered option**- options sold against stock held in the writer's portfolio

\***naked option**- options sold without the stock to back them up

#### **1. call options**

-give the holder the right to purchase a specified asset at the strike, or exercise price for a given period of time

\***exercise value**- the maximum of 0 or the current price of the stock less the strike price

$EV = \text{MAX}(\text{current stock price} - \text{strike price}, 0)$

#### **2. put options**

-give the holder the right to sell an asset at a given price for a given period of time

\***long-term equity Anticipation Security LEAPS**- options with longer maturities, up to 2.5 years

-cost much more but are worth more as well

-most options only have up to a 6 month maturity

### Option Pricing Models

#### **1. Binomial**

-assumes the stock can take only 1 of 2 values at the end of the period

5 steps

1. define the possible ending prices of the stock

2. find the ranges of values at expiration

3. buy exactly enough stock to equalize the payoffs for the stock and the option

4. create a riskless hedged investment

5. find the call option's price

\***binomial lattice**- pattern of stock movements

#### **2. Black-Scholes OPM**

-can be used to estimate the value of a call option

**7 assumptions**

1. the stock underlying the call option provides no dividends or other distributions during the life of the call option
2. there are no transaction costs for buying or selling either the stock or the option
3. the short-term, risk-free interest rate is known and constant during the life of the option
4. any purchaser of a security may borrow any fraction of the purchase price at the short-term, risk-free interest rate
5. short selling is permitted, and the short seller will receive immediately the full cash proceeds of today's price for a security sold short
6. the call option can be exercised only on its expiration date
7. trading in all securities takes place continuously, and the stock price moves randomly

**5 inputs**

1. P, current stock price
  2. X, strike price
  3. rRF, risk-free interest rate
  4. t, remaining time until expiration
  5. variance of the stock's rate of return
- a call option's value increases if: P increases, X decreases, rRF increases, t increases, or variance increases

**\*put-call parity relationship-** put option + stock = call option + PV of exercise price

4 uses in corporate finance: 1) real options analysis for project evaluation and strategic decisions 2) risk management 3) capital structure decisions 4) compensation plans

**\*real option-** something such a license or production capacity decision that can be implemented within a certain time frame

## II. Fixed-Income Securities

### Bond Prices and Yields

#### Bond Characteristics

- coupon bond is a fixed-income security that promises to pay a fixed or specified stream of income to the investors
- bond, face value, par value, coupon rate, bond indenture, zero-coupon bonds
- treasury notes and bonds have original maturities of less than a year; they are issued at or near par value, with their prices quoted net of accrued interest
- the sale, or invoice price of the bond, will equal the stated price plus the accrued interest; when bought between coupon payments

#### **Corporate bonds**

- bonds are often issued with a period of call protection; discount bonds issued significantly below their price offer implicit call protection
- \***call provisions**: call price, refunding, deferred callable
- \***convertible bonds**: may be exchanged, at the bondholder's discretion, for a specified number of shares of stock; they pay for this option by accepting a lower coupon rate on the security; conversion ratio, market conversion ratio, conversion premium
- \***putable bonds**- give the bondholder rather than the issuer the option to terminate or extend the life of the bond
- \***floating rate bonds**- pay a coupon rate at a fixed premium over a reference short-term interest rate; risk is limited because the rate is tied to market conditions
- preferred stock can also be considered fixed-income security
- many government agencies issue bonds

#### **International bonds**

##### **1. foreign bonds**

- denominated in the currency in the market in which it is sold
- Yankee bonds, Samurai bonds, Bulldog bonds

##### **2. euro bonds**

- issued in home currency but sold in foreign markets
- Euroyen, Eurosterling
- not government regulated; London is the biggest market

#### **Other types**

- inverse floaters, asset-backed, catastrophe, indexed bonds

#### Bond Pricing



Bond value = PV of coupons + PV par value

Invoice price = flat price + accrued interest

### **Bond yields**

\***yield to maturity YTM**- the single interest rates that equates the PV of a security's cash flows to its price; bond prices and bond yields are inversely related

-takes into account default risk

-the yield to maturity is often interpreted as an estimate of return to an investor who purchases a bond and holds it until maturity

\***current yield**- the bond's annual coupon payment divided by the bond price

\***premium bonds**- bonds selling above par value

-the coupon rate is greater than the current yield, which is in turn greater than the yield to maturity

\***discount bonds**- bonds selling below par value

-coupon rate is lower than the current yield, which is in turn lower than the yield to maturity

\***yield to call**- the yield until the bond is called

\***realized compound yield**- the yield that depends on the reinvestment rate of the coupon payments received

\***horizon analysis**- forecasting the realized compound yield over various holding periods or investment horizons

### **Bond prices over time**

-yield to maturity differs from holding period return in that holding period return cannot be known until the end of the period

-prices of zero-coupon bonds rise exponentially over time, providing a rate of appreciation equal to the interest rate; the IRS treats thus built-in price appreciation as imputed taxable interest income to the investor

-Treasury bills are zero-coupon bonds; Treasury STRIPS are also sold where the coupons are stripped and sold as separate financial instruments

-taxes will affect the HPR as well

### **Default risk and bond pricing**

-bond default risk is also known as credit risk

\***investment grade bonds**-BBB or Baa or above

\***junk bonds, high-yield**- lower-rated bonds

-when bonds are subject to potential default, the stated yield to maturity is the maximum possible yield to maturity that can be realized by the bondholder; in the event of default however, that promised yield will not be realized

### **Determinants of bond safety**

1. coverage ratios; times-interest earned, fixed-charge coverage

2. leverage ratio; debt-to-equity ratio

3. liquidity ratios; current and quick

4. profitability ratios; ROA

5. cash flow-to-debt ratio

-bond safety is often measured using financial ratio analysis; bond indentures are another safeguard to protect the claims of bondholders; common indentures specify sinking fund requirements, collateralization of the loan, dividend restrictions, and subordination of future debt

-indentures, sinking funds, dividend restrictions, collateral, debenture, default premium

## The Term Structure of Interest Rates

### The Yield curve

- \***term structure of interest rates**- refers to the interest rates for various terms to maturity embodied in the prices of default-free zero-coupon bonds
- the structure of interest rates for discounting cash flows of different maturities
- \***yield curve**- a plot of yield to maturity as a function of time to maturity; one of the key concerns of fixed-income investors
- bond pricing: bond stripping and bond reconstitution both represent opportunities for arbitrage
- represents expectations of future short rates; but it also reflects other factors such as the liquidity premium
- \***pure yield curve**- the curve for stripped, zero-coupon bonds
- \***on-the-run yield curve**- the curve for recently issued coupon bonds selling at or near par value

### Yield curve and future interest rates

- total returns from rolling-over short term bonds would equal the return from long term bonds
- \***spot rate**- yield to maturity on zero-coupon bonds; the yield that prevails today for a time period corresponding to the zero's maturity
- \***short rate**- the interest rate for that interval available at different point in time
- in a world of certainty, all holding period returns are the same
- \***forward interest rate**- the break-even future interest rate that would equate the total return from a roll-over strategy to that of a longer-term zero-coupon bond; used to show how yields to maturity and forward rates are related

### Interest rate uncertainty and forward rates

- creates the need for a liquidity premium
- \***liquidity premium**- compensates short-term investors for the uncertainty about the price at which they will be able to sell their long-term bonds at the end of the year

### Theories of the term structure

#### **1. Expectations hypothesis**

- simplest theory
- states that the forward interest rates are unbiased estimates of expected future interest rates; forward rate equals the market consensus opinion of the future short rate of interest
- but, forward rates differ from expected short rates because of the liquidity premium

#### **2. Liquidity preference**

- short-term investors dominate the market so that the forward rate will generally exceed the expected short rate
- this excess is the liquidity premium, and is expected to be positive

- a positive liquidity premium can cause the yield curve to slope upward even if no increase in short rates is anticipated
- the existence of liquidity premiums makes it extremely difficult to infer expected future interest rates from the yield curve; such an inference would be made easier if we could assume the liquidity premium remained stable over time; but both empirical and theoretical considerations cast doubt on the constancy of that premium

### **Interpreting the term structure**

-upward sloping yield curve is always associated with a forward rate higher than the spot rate, or current, yield to maturity

#### **2 reasons the forward rate could be high**

1. investors expect rising interest rates
2. they require a large premium for holding longer-term bonds

-a rising yield curve does not guarantee rising interest rates; because of the liquidity premium

-but generally, a rising yield curve will imply rising interest rates

-a rising yield curve is also a good economic indicator, as rising yield curves typically suggest growth

**\*term premiums**- the spread between short and long term government bonds; generally are positive; when they exceed, the yield curve is positive and upward sloping

#### **Why interest rates fall**

1. real rate
2. inflation premium

-nominal is composed of the real and the inflation premium

-high real rates indicate: expanding economy, high government deficit, tight monetary policy

### **Forward rates as forward contracts**

-forward rates are market interest rates in the important sense that commitments to forward (deferred) borrowing or lending arrangements can be made at these rates

## Managing Bond Portfolios

### Interest Rate Risk

-even default free bonds such as T-bills are subject to interest rate risk; longer-term bonds are generally more sensitive to interest rate shifts than short-term bonds

#### **Propositions- interest rate sensitivity**

1. inverse relationship between bond prices and yields
  2. increase in YTM results in smaller price change than a decrease of equal magnitude
  3. prices of long-term bond are more sensitive to changes in interest rates than short-term bonds
  4. sensitivity of bond prices to changes in yields increases at a decreasing rate as maturity increases; interest rate risk is less than proportional to bond maturity
  5. interest rate risk is inversely related to the bond's coupon rate; prices of high coupon bonds are less sensitive to changes in interest rates than prices of low-coupon bonds
  6. sensitivity of a bond's price to a change in its yield is inversely related to the yield to maturity at which the bond currently is selling
- they confirm that maturity is a major determinant of interest rate risk; but not the only, duration is needed also

### **Duration**

\***Macaulay's duration**- measure of the average life of a bond; weighted average of the times until each payment made by the security, with weights proportional to the present value of the payment

-duration is a direct measure of the sensitivity of a bond's price to a change in yield; proportional change in a bond's price equals the negative of duration multiplied by the proportional change in  $1 + y$

#### **Rules for duration**

1. the duration of a zero-coupon bond equals its time to maturity
2. holding maturity constant, a bond's duration is lower when the coupon rate is higher
3. holding the coupon rate constant, a bond's duration generally increases with its time to maturity; duration always increases with maturity for bonds selling at par or at a premium to par
4. holding other factors constant, the duration of a coupon bond is higher when the bond's yield to maturity is lower
5. duration of a level perpetuity is: 11 years at 10%, whereas maturity is infinite

-duration decreases as coupon rate increases, and duration generally increases with time to maturity

### Convexity

-the curvature of a bond's price-yield relationship ; accounting for convexity can substantially improve on the accuracy of the duration approximation for bond price sensitivity to changes in yields

-duration always understates the value of the bond; it underestimates the increase in bond price when the yield falls, and it overestimates the decline in price when the yield rises; due to the true price-yield relationship; convex

\***convexity**- the rate of change of the slope of the price-yield curve, expressed as a fraction of the bond price

-convexity is considered a desirable trait; bonds with greater curvature gain more in price when yields fall than they lose when yields rise; investors have to pay more and accept lower yields on bonds with greater convexity

### **duration and convexity of:**

#### **1. callable bonds**

-considered a bond with embedded options; compute the effective duration

\***effective duration**- the proportional change in the bond price per unit change in market interest rates

-this is necessary because when rates fall, instead of reaping a reward, the company calls the bond

-as rates rise, the bond acts like typical bonds; but when rates fall, there is ceiling on the possible price, so the bond is subject to price compression: the price yield curve lies below its tangency line, and the curve is said to have negative convexity

-in practice though, most corporate bonds now are not callable

#### **2. mortgage backed securities**

-the biggest market for which call provisions are important

-a portfolio of callable amortizing loans; the homeowner can call it whenever rates fall

-mortgage backed securities are a form of credit enhancement; by having Freddie Mac guarantee the loan, people who buy them don't suffer from default risk

-but although these securities are guaranteed in terms of principal and interest, they are still subject to interest rate risk

\***collateralized mortgage obligation CMO**- further redirects the cash flow stream of the mortgage backed securities to several classes of derivatives known as "tranches"

\***tranche**- allocates interest rate risk to the investors most willing to bear that risk

-the tranche will have 3 classes; all receive interest payments, but B does not receive principal until A is paid off; so you have short, intermediate, and long-term

### **Passive Bond management**

#### **1. bond-index funds**

#### **2. Immunization**

\***immunization strategies**- attempt to render the entity immune from movements in interest rates; may take the form of immunizing net worth, or instead, immunizing the future accumulated value of a fixed-income portfolio

-immunization of a fully funded plan is accomplished by matching the durations of assets and liabilities; to maintain an immunized position as time passes and interest rates change, the portfolio must periodically rebalanced

-classic immunization also depends on parallel shifts in a flat yield curve; given that this assumption is unrealistic, immunization will generally be less than complete; to mitigate

the problem, multifactor duration models can be used to allow for variation in shape of the yield curve

**\*dedication strategy, cash flow matching-** a more direct form of immunization; if a portfolio is perfectly matched in cash flow with projected liabilities, rebalancing will be necessary

### **Active bond management**

-consists of interest rate forecasting techniques and intermarket spread analysis

#### **Sources of potential profit**

##### **1. interest rate forecasting**

##### **2. mis-pricing situations**

###### 1. substitution swap

-an exchange of 1 bond for a nearly identical substitute

###### 2. intermarket spread swap

-the yield spread between 2 sectors of the bond market is temporarily out of line

###### 3. rate anticipation swap

-if belief is interest rates will fall, swap into bonds of longer duration; conversely

###### 4. pure yield pickup swap

-means of increasing returns by holding higher yield bonds

###### 5. tax swap

-to exploit a tax advantage

**\*contingent immunization-** mixed passive-active strategy; only immunize if a certain trigger is pulled

**\*horizon analysis-** type of interest rate forecasting; the analysts predicts the position of the yield curve at the end of some holding period, and from that yield curve predicts corresponding bond prices; bonds can then be ranked according to total expected returns (coupon plus capital gain) over the holding period

### **Financial engineering and interest rate derivatives**

-has created many new fixed-income derivative assets with novel risk characteristics

-inverse floaters

# III. Security Analysis

## Macroeconomic and Industry Analysis

### Domestic macroeconomy

-macroeconomic policy aims to maintain the economy near full employment without aggravating inflationary pressures; proper trade-off is an ongoing concern

key economic statistics for economy description

1. GDP
2. unemployment rate
3. inflation
4. interest rates
5. budget deficit
6. sentiment

### Demand and supply shocks

\***demand shock**- an event that affects demand for goods and services in the economy

#### **positive demand shocks**

1. reductions in tax rates
2. increases in the money supply
3. increases in government spending
4. increases in foreign export demand

-demand shocks characterized by aggregate output moving in the same direction as interest rates and inflation

\***supply shock**- an event that influences production capacity and costs

#### **supply shocks**

1. price of oil
2. freezes, floods, droughts destroying agricultural crops
3. educational level of workforce
4. wage rates labour is willing to accept

-supply shocks characterised by aggregate output moving in the opposite direction of inflation and interest rates

### Federal government policy

#### **Demand side**

##### **1. fiscal policy**

-government's spending and tax policy



-increase demand for goods (government spending) more than it reduces the demand for goods (tax policy)

-most direct way to influence economy, but longest to implement because of Congress

a. government spending

b. tax policy

## **2. monetary policy**

-manipulation of the money supply to affect the macroeconomy

-easy to implement but hard to see effects

a. contractionary

b. expansionary

-can stimulate the economy and increase GDP, but increases interest rates

-open market operations, interest rates, discount rate, fed funds rate

## **Supply side**

-treat the issue of the productive capacity of the economy

1. education level

2. infrastructure (communication and transportation systems)

3. research and development

4. the effect of taxes on working and incentives to care

## **Business cycles**

-the economy's recurring pattern of expansions and recessions

-peak, trough, cyclical industries, defensive industries

## **Leading economic indicators**

-values tend to change before those of other key economic variables

### **A. leading**

1. average weekly hours of production work (manufacturing)

2. initial claims for unemployment

3. manufacturer's new orders

4. vendor performance – slower deliveries diffusion index

5. new orders for nondefensive capital goods

6. new private housing units authorized by local building permits

7. yield curve slope: 10-year Treasury minus fed funds rate

8. stock prices – 50 common stocks

9. money supply M2

10. index of consumer expectations

### **B. coincident**

1. employees on nonagricultural payrolls

2. personal income less transfer payments

3. industrial production

4. manufacturing and trade sales

### **C. lagging**

1. average duration of unemployment

2. ratio of trade inventories to sales

3. change in index of labour cost per unit of output
4. average prime rate charged by banks
5. commercial and industrial loans outstanding
6. ratio of consumer instalment credit outstanding to personal income
7. change in consumer price index for services

### **Industry analysis**

- industries differ in their sensitivity to the business cycle
- more sensitive industries are those producing high-priced durable goods for which the consumer has considerable discretion as to the time of purchase; autos and consumer durables
- other sensitive industries are those that produce capital equipment for other firms; operating leverage and financial leverage increase sensitivity to the business cycle

**\*sector rotation-** shift the portfolio more heavily into specific industries or subsectors based on assessment of economy

### **Industry life cycle**

1. start-up phase
  2. consolidation phase
  3. maturity phase
  4. relative decline
- slow growers, stalwarts, fast growers, cyclicals, turnarounds, asset plays

### **Industry structure and performance**

1. threat of entry
2. rivalry between existing competitors
3. pressure from substitute products
4. bargaining power of buyers
5. bargaining power of suppliers

## Equity Valuation Models

### Valuation by comparables

1. book value
  - focus either on liquidation value or replacement cost
  - \***tobin's q**- market price/replacement cost
2. stock price
3. other ratios

### Intrinsic value v. market price

- PV of expected future dividends
- $V_0 = E(D_1) + E(P_1) / (1+k)$
- K= market capitalization rate, required rate of return

### Dividend discount models

- holds that the price of a share of stock should equal the PV of all future dividends per share, discounted at an interest rate commensurate with the risk of the stock
- DDM's give estimates of the intrinsic value of a stock; if price does not equal intrinsic value, the rate of return will differ from the equilibrium return based on the stock's risk; the actual return will depend on the rate at which the stock price is predicted to revert to its intrinsic value

#### **1. Constant growth DDM**

- asserts that if dividends are expected to grow at a constant rate forever, the intrinsic value of the stock is determined by
- $V_0 = D_1 / (k_1 - g)$

- simplistic in its assumption of a constant value of g
- appropriate for firms with stable growth, not many

\***dividend payout ratio** – 1 – plowback ratio, earnings retention ratio

- present value of future growth opportunities PVGO

#### **2. Multistage DDM**

- better suited for real life firms that experience growth stages

### Price-earnings ratio

- a measure of the market's assessment of the firm's growth opportunities
- firms with no growth opportunities should have a PE ratio that is just the reciprocal of the capitalization rate, k; as growth opportunities become a progressively more important component of the total value of the firm, the PE ratio will increase
- expected growth rate is related to both the firm's expected profitability and to its dividend policy

$$g = (\text{ROE on new investment}) * (1 - \text{dividend payout ratio})$$

-any DDM can be related to a simple capitalized earnings model by comparing the expected ROE on future investments to the market capitalization rate,  $k$ ; if the 2 rates are equal, the stock's intrinsic value reduces to  $\text{EPS}/k$

-can derive estimate of next year's EPS by a PE multiple derived from some empirical rule

### **Pitfalls in PE analysis**

1. earnings management

-may need to come up with your own ratios

### **Free cash flow valuation**

-used most often in corporate finance

1. estimate the value of the entire firm as the PV of expected future free cash flows to the entire firm

2. subtract the value of all other claims other than equity

-alternatively, the FCF can be discounted to a discount rate appropriate to the risk of the stock

### **Aggregate stock market**

-can be used to explain past behaviour or predict future behaviour

### **Key macroeconomic variables that determine the level of stock prices**

1. interest rates

2. corporate profits

Benjamin Graham- investing guru

# IV. Options, Futures, and other Derivatives

## Options Markets

### Option contract

-call (right to buy; put(right to sell)

\***premium**- purchase price of the option

-Americana and European options

-stock splits alter the terms of the contract: the exercise price reduces and the number of options increases relative to the split

-stock dividends over 10% are handled in a similar way

-cash dividends do not affect the value of the option

-option contracts are written on lots of 100 shares

\***Option Clearing Corporation OCC**- the clearinghouse for options trading; jointly owned by the exchanges on which options are traded; all individuals deal only with the OCC, it steps in when individuals agree on prices

-this guarantees contract performance

-if the underlying security is not owned, then the margin requirement is determined by the value of the underlying security as well as by the amount by which the option is in or out of the money

### **Options are traded on:**

1. stocks
2. stock indexes
3. foreign currencies
4. fixed-income securities
5. several futures contracts

### Values of options at expiration

-buying calls is bullish strategy; you gain when stocks go up

-selling puts is a bearish strategy- you gain when stocks go down

### Options strategies

-options can be used to either lever up an investors' exposure to an asset price or to provide insurance against volatility of asset prices

**1. covered calls**

- purchase of a share of stock with a simultaneous sale of a call on that stock
- can also have naked calls

**2. protective puts**

- buy a stock and a put for higher than the stock price; guarantees payment
- can just let the put expire if the stock price moves past the put

**3. straddles**

- buying a call and put, each with the same exercise price, X, and with the same expiration date; for when the price will fluctuate, but not know by how much

**4. spreads**

- a combination of 2 or more call options (or 2 or more puts) on the same stock with differing exercise price or time to maturity; some options are bought, and others are sold (written)

\***money spread**- the purchase of 1 option and simultaneous sale of another with a different exercise price

\***time spread**- sale and purchase of options with differing expiration dates

**5. collars**

- brackets the value of a portfolio between 2 bounds
- buying a put and writing a call

**Put-call parity relationship**

\***put-call parity theorem**- relates the prices of put and call options; if the relationship is violated, arbitrage will result

**1. call plus bills portfolio**

- buying a call with T-bills with same maturity and payment; at least get money from T-bill investment, and could gain from call if the security rises in value

**2. put plus stock portfolio**

- buying a put with a stock

**Optionlike securities**

1. callable bonds- call options
2. convertible bonds- call options
3. warrants- essentially call options
4. **collateralized loans**- implicit call option

**5. leveraged equity and risky debt**- have call option to buy back the firm when debt is paid off

- the required debt payment represents the exercise price of the implicit option, while the value of the firm is the underlying asset; equity holders have a put option to transfer their ownership claims of the firm to the creditors in exchange for the face value of the debt
- can use option pricing strategies for debt as well

**Financial engineering**

- options can be used to custom design new securities or portfolios with desired patterns of exposure to the price of an underlying security( futures can be used for this too)

\***index linked CD**- gain 70% (**participation rate or multiplier**) when markets go up, but losing nothing when they go down; call options, because prosper when stocks go up

## **Exotic options**

### **1. Asian options**

- similar to American and European
- have payoffs that depend on the average price of the underlying asset during at least some portion of the life of the option

### **2. barrier options**

- have payoffs that depend not only on some asset price at option expiration, but also on whether the underlying asset price has crosses through some barrier
- \***down and out, knockout**- automatically expires when the option falls below some barrier price
- \***down and in, knock in**- will not pay unless the option falls below some barrier price at least once during the option

### **3. looback options**

- have payoffs that depend on part on the maximum or minimum price of the underlying asset during the life of the option;
- \***lookback call**- pays maximum instead of final stock price during the life of the option

### **4. currency-translated options**

- have either asset or exercise prices denominated in a foreign currency
- \***quanto**- allows the investor to fix in advance the exchange rate at which an investment in a foreign currency can be converted back into dollars; provides a random number of options

### **5. digital options**

- binary, bet options: have a fixed payoff that depend on whether a condition is satisfied by the price of the underlying asset; \$100 for a certain price reached
- can be traded on various macroeconomic indicators at the Chicago Mercantile X

## Option Valuation

### Intrinsic and Time Values

#### 2 components to option value

**1. intrinsic value-** So  $-X$  is the intrinsic value of in-the-money options, because it gives the payoff that could be obtained by immediate exercise

-intrinsic value is 0 for out-of-the money or at-the-money options

**2. time value-** difference between actual call price and intrinsic value

-the difference between the option's price and the value the option would have if it were expiring immediately

-part of the value attributable to still having positive time to maturity

\***volatility value-** most of the option's time value; the right not to exercise if the value is not profitable

#### Determinants of option values

1. stock price
2. exercise price
3. volatility of the stock price
4. time to expiration
5. interest rate
6. dividend rate of the stock

#### Call options are more valuable when:

1. the exercise price is lower
2. greater time to maturity
3. stock's volatility is greater
4. stock's dividends are lower
5. greater interest rates
6. greater stock price

#### Put options are more valuable when:

1. the exercise price is greater
2. greater time to maturity
3. stock's volatility is lower
4. stock's dividends are greater
5. lower interest rates
6. lower stock price

### Restrictions on option values

#### Call options

1. cannot be negative
  2. lower bound-
  3. higher bound- stock price
- call options must sell for at least the stock price less the PV of the exercise price and dividends to be paid before maturity



-this implies that a call option on a non-dividend paying stock may be sold for more than the proceeds from immediate exercise, so-usually never pays to exercise a call option early

-thus, European calls are worth as much as American calls on stocks that pay no dividends, because the right to exercise the American call early has no value

### **Put options**

1. early exercise is a plus

### **Binomial options pricing model**

-as the number of periods increases, the binomial model can approximate more realistic stock price distributions

-utilizes the binomial tree approach; as the number of subintervals increases, the number of possible stock prices increases

-as the number of intervals increases, the frequency distribution approaches the lognormal distribution rather than the normal distribution

-is an algorithm

### **process**

1. stock price range of 30 and option price range of 10

2. hedge ratio of  $10/30 = .333$

3. portfolio with  $1/3$  share with 1 written option would have an end of year value of \$30 with certainty

4. PV of \$30 with 1 year interest of 10% is \$27.27

5. set value of hedged position to PV of certain payoff:  $33.33 - C_0 = 27.27$

6.  $C_0 = 6.06$

### **Black-Scholes option pricing valuation**

-can be seen as a more limiting case of the binomial pricing model, as the holding period is divided into progressively smaller subperiods when the interest rate and stock volatility are constant

-this formula applies to stocks that pay no dividends

#### **1. Call option valuation**

#### **2 more assumptions**

-both the risk-free interest rate and stock price volatility are constant over the life of the option

#### **Assumptions**

1. stock pays no dividends until after the option expiration date

2. both the interest rate and volatility are constant

3. stock prices are continuous, meaning that sudden extreme jumps such as mergers are ruled out

**\*implied volatility**- the volatility level for the stock that the option price implies

-then judge whether the actual stock standard deviation exceeds the implied volatility; if it does, the option is a good buy; if actual volatility exceeds the implied volatility, then its fair price would exceed the observed price

## 2. Dividends and call option valuation

-dividend adjustments may be adequate to price European calls on dividend-paying stocks, but the proper treatment of American calls on dividend-paying stocks requires more complex formulas

### 2 options

1. apply Black-Scholes formula assuming early exercise, thus using the actual stock price and the time until expiration of the dividend payment
2. apply the Black-Scholes formula assuming no early exercise, and using the dividend adjusted stock price

**\*pseudo American call option-** the maximum value derived by assuming that the option will be held until expiration and the value derived by assuming that the option will be exercised just before the ex-dividend date

## 3. Put option valuation

-put options may be exercised early, whether the stock pays dividends or not; therefore, American puts are generally worth more than European puts

-European put values can be derived from the call value and the put-call parity relationship; this technique cannot be applied to American puts for which early exercise is a possibility

## Black-Scholes and hedging

**\*hedge ratio, option's delta** – allows us to summarize the overall exposure of portfolios of options with different exercise prices and times to maturity

the number of shares of stock required to hedge the price risk involved in writing 1 option; hedge ratios are near 0 for deep out-of-the money call options and approach 1.0 for deep in-the-money calls

-a call option has a positive hedge ratio and a put option a negative hedge ratio

-although hedge ratios are less than 1.0, call options have elasticities greater than 1.0; the rate of return on a call (as opposed to the dollar return) responds more than 1-for-1 with stock price movements

**\*option elasticity-** the % change in option price per % change in stock price

## Portfolio insurance

**\*portfolio insurance-** can be obtained by purchasing a protective put option on an equity position

### Difficulties to insuring a portfolio

1. unless the investor's portfolio corresponds to a standard market index for which the puts are traded, a put option on a portfolio will not be available for purchase
2. if index puts are used to insure a non-indexed portfolio, tracking errors will occur
3. the desired horizon of the insurance program must match the maturity of a traded put option in order to establish the appropriate protective put position

-when the appropriate put is not traded, portfolio insurance entails a dynamic hedge strategy where a fraction of the equity portfolio equal to the desired put option's delta is sold and placed in risk-free securities

**\*dynamic, delta hedging**- constant updating of the hedge ratio

-1 reason why portfolio insurance has been said to contribute to market volatility

### **Hedging bets on mispriced options**

-entails buying different amounts of options at different prices

**\*delta**- change in value of option/ change in value of stock

-tells us how many shares we must hold to offset our exposure to the stock

**\*option delta**- used to determine the hedge ratio for options positions; delta-neutral portfolios are independent of price changes in the underlying asset; even delta-neutral option portfolios are still subject to volatility risk, however

**\*gamma**- sensitivity of the delta to the stock price

-analogous to bond convexity

-the curvation of the value function means that hedge ratios or durations change with market conditions, making rebalancing a necessary part of hedging strategies

**\*volatility risk**- risk incurred from unpredictable changes in volatility

-must estimate correct volatility for hedging strategies to work with options

## Futures Markets

### Futures contract

- trade on a wide variety of commodities, financial products, and currencies
- \***forward contract**- calls for future delivery of a good at a currently agreed upon price
- call for no cash transfers until maturity
- \***long position**- obligated to purchase the good
- \***short position**- obligated to deliver the good
- \***futures contract**- trades on exchanges, more standardized, greater liquidity
- is a zero-sum game, with wins and losses netting to 0

### Mechanics of future trading

- \***clearinghouse**- acts as the intermediary between each pair of traders; short for each long and long for each short
- traders post margins to guarantee their own performance on the contracts
- \***reversing trade**- can be used to liquidate a position back to net 0
- \***open interest**- the number of contracts outstanding
- long and short are not counted separately, so could be either long or short contracts outstanding; the clearinghouse nets to 0, so it not counted in open interest
- most people liquidate before contract maturity date, and reverse positions to realize a small loss or gain
- for commodities, goods are just transferred via warehouse receipt

- \***marking to market**- daily settling; means gains and losses debit or credit to the traders account at settlement each day; main way futures and forwards differ
- when accounts fall this margin requirement, a margin call will be issued
- \***convergence property**- futures prices and the spot price must converge at maturity; otherwise, arbitrage would be possible

- for commodities, the quality of the good can affect delivery and future price
- \***cash settlement**- for example, for an index of stocks; delivery of every stock would be impractical
- regulations are set to prevent violent price fluctuations; depends on previous future price and new close of the product; set by the CFTC, commodities futures trading commission
- because of market-to-market procedure, investors do not have control over the tax year in which they realize gains or losses; price changes are realized gradually, with each daily settlement; therefore, taxes are paid at year-end on cumulated profits or losses regardless of whether the position has been closed out

### Futures markets strategies

#### Hedging or speculating

##### 1. hedging

- to protect against price movement

**\*short position-** to offset gains or losses against assets already in inventory; protect against price declines

**\*long position-** to offset gains or losses in the purchase price of a good; protect against price increases

## **2. speculation**

-using the contracts to take a stand on the ultimate price of an asset

**\*short position-** to gain from price declines

**\*long position-** to gain from price increases

**\*cross hedging-** hedging a position using futures on another asset

## **Basis risk and hedging**

**\*basis-** the difference between the futures price and the spot price

**\*basis risk-** if the contract and asset are to be liquidated early, this risk arises because the futures and spot price do not move in perfect lockstep before the delivery date

-some speculators try to profit from movement in the basis; long-spot short-futures position will profit when the basis narrows

**\*calendar spread position-** where the investor takes a long position in a futures contract of 1 maturity and a short position in a contract on the same commodity, but with a different maturity

-profits accrue if the difference in futures prices between the 2 contracts changes in the hoped-for direction; that is, if the futures prices on the contract held long increases by more (or decreases by less) than the futures price on the contract held short

## **Determination of futures prices**

### **1. Spot-futures parity relationship**

-says that the equilibrium futures price on an asset providing no service or payments (such as dividends) is: any deviation results in arbitrage opportunities

**\*cost-of-carry model-** states that the futures price must exceed the spot price by the net cost of carrying the asset until maturity date  $T$

-also known as the spot-futures parity relationship

-the equilibrium futures price will be less than the currently expected time  $T$  spot price if the spot price exhibits systematic risk; this provides an expected profit for the long position who bears the risk and imposes an expected loss on the short position who is willing to accept that expected loss as a means to shed systematic risk

-must also predict spreads between futures contracts of different maturity dates

-there can be slight differences between futures and forward contracts because of the nature of the contracts; because forward proceeds are realized only on delivery and futures are marking-to-market

## **Future prices v. expected spot prices**

### **1. expectations hypothesis**

-future price equals the expected value of the future spot price; simplest theory

### **2. normal backwardation**

-natural hedgers are the suppliers

-futures prices are bid down in order to shed risk and offer a profit motive for people to take the long positions

### **3. contango**

-natural hedgers are the purchasers

-futures prices are bid up in order to shed risk and offer a profit motive for people to take the short positions

### **4. modern portfolio theory**

-speculators with well-diversified portfolios will hedge to gain profit when it presents itself

## Futures and Swaps: Markets and Applications

### Foreign exchange futures

- foreign exchange futures trade on several foreign currencies, as well as on a European currency index
- futures contracts calling for cash settlement are traded on various stock market indexes; the contracts may be mixed with T-bills to construct artificial equity positions, which makes them potentially valuable tools for market timers
- market index contracts are also used by arbitrageurs to profit from violations of the stock-futures parity relationship

### **Interest rate parity**

- \***interest rate parity relationship**- the thought that futures and spot rates will be in alignment because of interest rates between countries
- \***covered interest arbitrage relationship**- another term for interest rate parity
- \***direct quote**- dollars per pound
- \***indirect quote**- pounds per dollar

### **Using futures to manage exchange rate risk**

- \***hedge ratio**- the number of hedging vehicle such as futures contracts required to offset the risk of the unprotected position
- the hedge ratio for systematic market risk is proportional to the size and beta of the underlying stock portfolio
- the hedge ratio for fixed-income portfolios is proportional to the price value of a basis point, which in turn is proportional to modified duration and the size of the portfolio

### Stock-index futures

- these contracts for a cash settlement, not delivery of a good; \$XXX times an index
- creating synthetic stock positions**

- synthetic stock positions can be created using T-bills; hold T-bills and just adjust the long and short futures position; minimizes transaction costs

#### **2 steps**

1. purchase as many market-index futures contracts as you need to establish your desired stock position; desired holding of 1000 would require 4 contracts at  $250 \times \text{index}$
2. invest enough money in T-bills to cover the payment of the futures price at the contract's maturity date; the necessary investment will equal the PV of the futures price that will be paid to satisfy the contracts; the T-bill contracts will grow by the maturity date to a level equal to the futures price

### **Index arbitrage**

- \***index arbitrage**- an investment strategy that exploits divergences between the actual futures price and its theoretically correct parity value
- index futures can be used to hedge market risk**

1. if futures prices are too high, short the futures contract and buy the stocks in the index
2. if futures prices are too low. Go long in futures and short the stocks

**impractical for 2 reasons**

1. transaction costs
2. very difficult to buy or sell all 500 stocks at once

**\*program trading-** allows coordinate purchases or sales of entire portfolios of stocks  
SuperDot NASDAQ system

**Index futures to hedge market risk**

-the index's beta is the key

-if you do poorly when the market does well, you need a negative hedge ratio

**\*market-neutral bet-** just on the stock; take a position on the stock to capture its alpha (abnormal risk adjusted return), but that market exposure is fully hedged (beta is 0)

**Interest rate futures**

-may be written on the prices of debt securities (as in the case of the T-bond futures contracts) or on interest rates directly (as in the case of Eurodollar contracts)

**\*cross-hedging-** most hedging activity is this; meaning that the hedge vehicle is a different asset than the one to be hedged

**Hedging and hedge funds**

-many hedge funds use hedging strategies to create market neutral bets on perceived instances of relative mispricing between 2 or more securities; these strategies often use combinations of long/short positions, often involving derivative securities, to hedge away broad market exposure

-they are not arbitrage strategies, but pure plays on a particular perceived profit opportunity; other hedge funds use derivatives to make directional bets, which are unhedged speculative positions based on forecasts for the performance of a particular market sector

**\*convergence arbitrage-** at a given date, the pricing discrepancies between 2 securities almost necessarily must disappear; the pricing must converge

LTCM- used this; lost when 29 year bonds lost in regards to 30 year bonds on Russian default

**\*convertible bond arbitrage-** shorting the bond and going long on the stock

**\*directional strategies-** outright bets; not hedged

**Swaps**

-call for the exchange of a series of cash flows, may be viewed as portfolios of forward contracts; each transaction may be viewed as a separate forward agreement

-however, instead of pricing each exchange independently, the swap sets 1 "forward price" that applies to all of the transactions; therefore, the swap price will be an average of the forward prices that would prevail if each exchange were priced separately

**\*foreign exchange swap-** call for the exchange of currencies on several future dates



**\*interest rate swap**- call for the exchange of a series of cash flows proportional to a given interest rate for a corresponding series of cash flows proportional to a floating interest rate

**\*notional principal**- way to describe the size of the swap agreement; pay % on it and receive a % on it

-involves the exchange of a fixed cash flow for a variable cash flow that depends on the short-term interest rate

-good for fixed-income managers

-dealer gets the bid ask spread

-swap is a multiperiod forward contracts that trade OTC; biggest is the Eurodollar contract; others for other interbank loans in other currencies: LIBOR EURIBOR

-pricing swaps involves the finding the level annuity F, with the same PV as the stream of annual cash flows that would be incurred in a sequence of forward rate agreements

-credit risk is real, as there is the possibility of default by major swap dealers

### **Commodity future pricing**

-complicated by costs for storage of the underlying commodity

-otherwise can use DCF with CAPM or APT

# Financial Services

## **I. Banking**

Money and Banking

Assets

Liabilities and Shareholders Equity

Other Services/Operations

## **II. Insurance**

Products

Processes

## **III. Securities**

Products

Processes

## **IV. Regulation**

Banking

Securities

Insurance

- Financial Modernization Act 1999 allowed banks to sell investment and insurance products
- banks, insurance companies, and securities firms are commingled now
- commercial banks (largest), global banks, regional banks, local banks, savings and loans (thrifts, second largest), credit unions, federal reserve banks
- interest on loans is primary source of revenue: commercial, consumer (credit, student loans, autos) and mortgage lending
- money to lend comes from deposits
- technology and diversification of services has become huge

## **1. Money and Banking**

### **2. Assets**

1. Cash and Due from Banks
2. Federal Funds Sold and Securities Purchased under Resale Agreements
3. Interest-bearing Accounts
4. Trading Securities
5. Securities Available for Sale
6. Loans
  - i. Commercial
  - ii. Residential
  - iii. Consumer
  - iv. Leases
  - v. Credit Card
  - vi. International
7. Allowance for Loan Losses
8. Premises and Equipment
9. Customer Acceptance
  - letters of credit
10. Intangible Assets
11. Other Assets

### **3. Liabilities and Shareholders Equity**

#### **4. Other Services/Operations**

1. Payroll/Employee Benefits
2. Automated Clearing House Wire Transfer
3. Branch Operations

#### **4. Trust**

- i. Personal
- ii. Corporate
- iii. Employee Benefit
- iv. Transfer/Registrar
5. Investment Products
6. Asset/Liability Management
7. Use of Derivatives
8. Statement of Cash Flows

***4. Money and Banking***

1. Role of Money and Banking
2. Bond and Stock Markets
3. Effect of Interest Rate Movements
4. Monetary Management Theories

# I. Banking

-financial sector and banking play an important role in the allocation of capital resources and monetary growth in an economy

-banks: process payments, control risks, and need regulation

## 1. Role of Money and Banking

-bank can lend money up to portion of its reserves

-money has value in relation to purchasing power

-money consists of instruments with certain characteristics and is used for simplicity

## 2. Bond and Stock Markets

-play very crucial liquidity roles in the economy

## 3. Effect of Interest Rate Movements

-lower rates typically stimulate the economy better

-higher rates do not lead to more saving: people save more because of higher rates, but also spend more because they have more now

-the health of the economy affects interest rates by influencing supply of and demand for credit

-interest rates fall in a recession because of less demand for credit, and rise in an expansion because of more demand for credit; government's credit is inversely related to the economy's; they need more in a recession and less in an expansion

## 4. Monetary Management Theories

-the Fed's monetary policies are designed to influence investment spending; lower interest rates serve to stimulate investment activities

### 4 Theories

1. change the discount rate- decrease encourages borrowing and lending
2. open market operations
3. moral suasion
4. reserve requirements- affects amount of money available for lending

## Financial Statement Application

-discusses assets, liabilities, SE, wire transfers, branches, and trusts for: commercial banks, savings banks, credit unions, trust companies, credit card companies, leasing companies, and mortgage bankers

## Assets

-future economic benefits; tangible/intangible and current/noncurrent

### 1. Cash and Due from Banks

-due from banks are deposits in other banks: used for liquid reserves, transfers of funds, and compensation for services

#### *4 Categories of Cash and Cash Due*

**1. cash items**- easily liquidated: maturing coupons, returned checks, unposted debits

**2. cash on hand**- funds in bank, ATM, satellites, tellers

**3. clearings and exchanges**- checks drawn on other banks

**4. due from bank accounts**- used to collect checks, either credit the bank's account or send them a bank draft

-cash and due from other bank accounts that are listed as a caption on the balance sheet should include all currency and coin, cash being collected, and account balances with other banks (except material interest-bearing accounts, which are disclosed separately)

### 2. Federal Funds Sold and Securities Purchased under Resale Agreements

-sold for temporary reserve requirements; good for 1 day only; must be returned after 1 day

-could be sold through unsecured or collateralized loans

-banks borrow under repo agreements and sell under reverse repo (resell) agreements

-no physical transfer of funds; federal funds sold journal is adjusted accordingly, and the Fed adjusts the bank's reserves accordingly

-any Fed funds transaction that matures in more than 1 day is a loan

### 3. Interest-bearing Accounts

-time deposits: savings accounts, negotiable orders of withdrawal NOW, CDs

-accounts more than 100,00 should be disclosed on financial statements; material NOW as well

### 4. Trading Securities

-securities for sale within 1 month

-commercial banks can underwrite and initiate securities transactions; management decides which ones are for sale or investments; don't use suspense accounts

-usually record as of trade date; settlement date can be used if the time period is immaterial; must record both purchase and sale and income effects

-value at market value or fair value if there is no market value; unrealized losses/gains should be included in income statement

-when transferring from trading to investment: gains and losses are trading income; record in investment account as new acquisition

-when transferring from investment to trading: losses go to security losses at time of transfer and gains go to investment security gains at final disposition

-interest can be recorded as either: interest income or trading income, but these should be reported separately for material amounts

### 5. Securities Available for Sale

-for sale within next year classified as current assets; otherwise long-term assets

-reported at fair value; unrealized losses/gains not reported on income statement but on SE; these loss/gains are carried forward to next periods and adjusted based on current FV

## **6. Loans**

-state and federal regulations limits lending amounts to individuals, types, and conditions for officers

### **4 Classifications**

**1. time loan-** specific time period

**2. demand loan-** no fixed maturity date; payable on demand of lender

**3. line-of-credit-** credit cards (revolving credit); borrow to a certain limit

**4. instalment loan-** periodic principal and interest payments; real estate mortgage

-each type has different general ledger accounts

-interest on time, demand and real estate loans accumulates daily or monthly; this income is credited to operating income

-interest stops accruing when accounts are suspended; if principal is repaid then the bank must determine how much is principal and how much is interest reduction

-accrued interest receivable is recorded either as other assets or stated separately; unearned discounts, allowances for loan losses, and unamortized loan origination fees should be deducted from loan balances; other unamortized loan fees should be presented as other liabilities if they are material

-related-party loans must be disclosed in either loan portfolio or SE

-customer overdrafts should be recorded as loans on the financial statements

### **6 Types**

**1. Commercial-** working capital, asset-based, seasonal, term, agricultural, floor-plan (autos)

**2. Residential-** secured by mortgages, deeds of trust, land contracts, or other real estate lien; principal repayment may have full, partial, or negative amortization with balloon payment; some borrowers may need credit insurance; FHA and VA insure loans

**3. Consumer-** personal items and are repaid monthly; instalment and credit cards

### **4. Leases**

**5. International-** foreign governments or banks; also commercial loans by foreign banks; have cross-border risk; foreign or cross-border loans

### **7. Allowance for Loan Losses**

-if more is needed than is allocated, then the reserve is increased and the difference is charged to operating expenses

-uncollectible loans should be written off and charged against the reserve for possible loan losses; banks with assets under 25 million should charge uncollectible loans directly to operating expenses

### **8. Premises and Equipment**

-bank's assets can't exceed a certain % of capital and surplus, unless approved

-banks can't own rental property unless it is used in the near future; national banks must sell any rental property within 5 years that is not used for banking purposes

-real estate not used for banking purposes should be classified as other real estate owned on the balance sheet; the amount of the real estate holding should be listed at the lower of the annual value or the bank's investment; a bank's real estate holding must be appraised each year, unless the investment is under 25,000 or is 5% or less of its equity capital

- banks must use fair value to record assets acquired through foreclosure, but it should not exceed the amount at which the investment was recorded; if there is a loss, recognize it
- banks should capitalize and depreciate their fixed assets

### **9. Customer Acceptance**

- letters of credit; state that the bank will guarantee payment on drafts or bills of exchange of a person or entity; anyone they write is a liability and anyone they hold is a loan
- usually valid for 6 months; irrevocable (customer can quit) or revocable (bank can quit)
- can be used as a form of payment, but usually are used to prevent default
- the issuing bank has 3 days to honour a demand for payment subject to a letter of credit

### **10. Intangible Assets**

- ideas, expertise, capacities, and privileges belonging to an entity; do not physically exist
- patents, copyrights, franchises, trademarks, goodwill, leasehold improvements
- are recorded at cost initially; can depreciate or amortize with straight line

### **11. Other Assets**

- will normally be the individual ledger accounts; accts. receivable etc.
- when they are material, they may be presented on the balance sheet



## Liabilities and Shareholders Equity

-probable future sacrifices and what remains after liabilities are subtracted from assets

### 1. Deposits

#### 4 Types

#### 1. checking deposits

-NOW checkings pay interest

-checks are printed in MICR magnetic ink font at the bottom so they can be read by machines

-banks record any check they write or certify as a liability; the cash account is reduced only after the check is paid; issued or certified items are listed in a check register and removed from the file after they are paid

#### 2. savings deposits

-to make purchases, the money must be transferred to transaction deposits (checkable deposits) or currency

-sizeable portion of M2 aggregate

-similar to MMDA in that withdrawals are limited; no maturity date

#### 3. CDs

-bear interest for a fixed period of time

-similar to savings but accrue interest for a fixed period of time

-can have interest deferred to another account; reduced effects of compounding

-banks will roll them over if you do not act on it

-substantial penalty for early withdrawal; 6 months interest for a 5 year CD

-usually need at least 1,000 or 10,000

#### 4. IRAs

-bear interest for a fixed period of time

-several different types: Roth (taxed before deposit), traditional (taxed after withdrawal), rollover (funds come from another account, not cash), conduit (rollover instrument), SEP (self-employed), SIMPLE (similar to 401(K) but with lower contribution limits)

-Economic Growth and Tax Relief Reconciliation Act 2001 EGTRRA significantly relaxed what funds could be rolled in and what plans could be rolled over

-can be funded with most securities, but not: collectibles (coin and bullion), insurance, real estate (unless it is a REIT)

-federal protection for IRA's from bankruptcy

-can't be borrowed against, but can be transferred to other accounts temporarily and transferred back within 60 days to avoid penalty

-posting of time deposit transactions occurs on the day the transaction occurs or the next day; during the posting process, banks may reject some transactions due to improper endorsements or stop orders or if it would create an overdraft

### 2. Securities Sold under Repo Agreements and Fed Funds Purchased

-can be nonsecured or collateralized

-exceeding 1 day is a loan

-repos and reverse repos

### **3. Other Borrowed Funds**

-short-term borrowing (commercial paper, lines of credit, unsecured notes), debentures, discounting or advancing through counts with a Fed Reserve Bank (discounting is Fed discounting with recourse the bank's eligible loans; advancing is when the bank issues a promissory note using the Fed as collateral), treasury tax and loan note options (deposits at Fed Reserve subject to withdrawals and supported by open-ended, interest bearing notes), mortgages payable

-borrowings from the Fed Reserve are grouped with promissory notes and reported on the balance sheet as other borrowed funds; debentures, subordinated notes, and mortgages payables are often included in separate liability categories on the balance sheet

### **4. Long-Term Debt**

-notes (single investor) and bonds

-discount when market rate exceeds coupon; premium when coupon exceeds market rate

-discount on bonds payable is debited when selling at a discount; premium on bonds payable is credited when selling at a premium; discount or premium is amortized over the life of the bond

-bond issuance costs are charged to a prepaid expense account

### **5. Preferred/Common Stock**

-regulations limit the amount of equity a bank may have in relation to the bank's size and asset mix

-2 ways to account for stock dividends: transfer from RE to capital stock the par value of shares being issued; transfer from RE to permanent capitalization account FV of shares being issued

-stock dividends are recorded at FMV of the stock on the date the dividend was declared

### **6. Retained Earnings**

-the accumulated reserves and expenses of a bank; increases or decreases based on fluctuations in earnings and dividend distributions

### **7. Treasury Stock**

-outstanding stock a corporation reacquires or purchases

-can be used to prevent takeovers or do takeovers or for employee stock option plans

-reduces SE and is deducted from the contributed capital and earned capital lines on the balance sheet

-reacquiring increases earnings per share

-dividends are not paid on TS

-TS can be recorded at cost or the stated (par) value

### **3. Other Services/Operations**

#### **1. Payroll/Employee Benefits**

-salaries are 1 of the biggest expenses

-largest risk: employees no longer on the payroll, unearned overtime sick and vacation days, unauthorized salary increases, miscalculating social security deductions; failing to monitor employee benefit providers

#### **2. Automated Clearing House Wire Transfer**

-electronic payment network used by: individuals, businesses, financial institutions and governments

-better cash management and lower costs than paper systems

- includes Canada as well
- can access: checking and savings, loan accounts, and general ledgers
- includes all the payment info on the ACH transaction

### **Steps**

#### **1. How Does it Work**

- receiver authorizes the originator; originator passes the information along to the Originating Depository Financial Institution ODFI; ODFI presents information to ACH operator; ACH processes and sends it to Receiving Depository Financial Institutions RDFI; RDFI posts entries on settlement date
- settlement is the actual transfer of funds
- timing of settlement is based on effective entry date on the ACH file and the time of delivery to ACH operator; ACH debits delivered no earlier than 1 business day; ACH credits delivered no earlier than 2 business days from settlement date
- if it can't be done at that day, the next business day is the rule

#### **2. What is the Legal Framework for ACH**

- must abide by ACH and National Automated Clearing House Association NACHA
- Federal Regulation E puts additional restrictions on the RDFI and defines consumer rights
- Uniform Commercial Code Article 4A places requirements on ODFIs for corporate transactions and the RDFI receiving them
- federal government payments must conform to the Codes of Federal Regulation, Green Book
- transactions include: direct payroll deposits, government payments, pension payments, dividends, direct debits, corporate cash disbursements, corporate payments
- wire transfer system is another method of EFT: immediate and irreversible
- FedWire (Fed) and Clearing House Interbank Payments System CHIPS (New York Clearing House, New York area) do most of the wire transfers in the US
- definitions: correspondent banks, credit party (party to be paid), draw down (reduce account balance), execution date, PUPID (pay upon proper identification), repetitive transfer (for multiple uses, just fill in new monies), SWIFT (society for worldwide interbank financial telecommunications)

#### **3. Branch Operations**

- each state has different branch regulations; some operate under national charters under the Office of the Comptroller of the Currency OCC and do not have to comply
- Interstate Act of 1994 allows interstate banking through the merger of banks in the same state owned by the same holding company; states can disregard the act if they want
- de novo bank is a new bank not resulting from a merger; Interstate Act allows de novo branches as long as they allow branches from other states
- Fed Board regulates US banks going into foreign countries; the foreign branches must comply with the same regulations
- many people use online banking more now

#### **4. Trust**

- can be personal or corporate trusts
- trust departments administer trusts, estates, pension accounts, profit sharing accounts, and custodian accounts; the board of directors has fiduciary responsibility for; trust accounts must be reviewed once every 15 months

- all bank employees doing trusts must be bonded
- trust accounts are not assets; must be held separately; trust records are kept for 3 years after
- trust accounts can't be invested in securities; funds can't be transferred between trusts unless there is legitimate reason to do so

### **Terms**

#### **1. Personal Trust Services**

- estate settlement, trust development (trusts by: agreement, declaration, under will, charitable, by court order) , serve as guardian of estates, serve as co-fiduciary, serve as agent (powers of attorney, escrow, advisory, safekeeping)

#### **2. Corporate Trust Services**

- for functions related to stocks and bonds; trust agreement or indenture specifies the bank's duties
- additional duties: stock transfer agent, bond registrar, stock registrar, dividend reinvestment agent

#### **3. Employee Benefit**

- serve as administrator, trustee, co-trustee, agent, custodian, or depository
- types: pension plans, self-employed retirement trusts (Keogh), IRA
- Pension Benefit Guarantee Corporation PBCG guarantees defined benefit plans
- defined contribution plans include profit-sharing and stock bonus plans
- IRA withdrawals must occur between ages of 59.5 and 70.5

#### **4. Transfer/Registrar**

- transfer agent: record stock ownership plans, records, pay dividends, stock subscriptions and exchanges, and proxy notices
- must ensure stock certificates are properly signed and authorised
- registrar: stock and bond issues; ensures too many shares are not issued

#### **5. Investment Products**

- OCC restricts types of security investments national banks can make

#### **5 Types**

1. Type I- bank-eligible; backed by US government; banks can invest in
2. Type II- international banks, states and college stuff; 10% investment in 1 source
3. Type III- others; no more than 10% total
4. Type IV-interests in pools of loans; MBS; 25% investment in 1 source
5. Type V- marketable investment grade not Type IV; 25% in 1 source

#### **6. Asset/Liability Management**

- ALM is short and long term planning tool
- manages 4 types of risk: credit, liquidity, interest-rate, capital risk
- need specific guidelines developed from research and historical data

#### **7. Use of Derivatives**

- the performance of underlying asset can determine amount and timing of payoff
- payoffs can be in cash or the underlying asset
- indices used can be anything: CPI, stock market, weather temperatures
- includes: swaps, options, futures contracts (standardized), forward contracts
- financial weapons of mass destruction: LTCM
- notes to statements should include them if they are material; company should have firm guidelines for investors as well and good information for them

**8. Statement of Cash Flows**

-reconciles beginning and ending balances

-includes cash and cash equivalents

-O, I, F

## II. Insurance

-includes: marketing sales and distribution, underwriting, reinsurance, actuarial claims, financial reporting, compliance, investment operations, risk management, premium audit, administration

### 1. Products

#### 1. Individual/Group

1. whole life
  2. term life
  3. universal life
  4. endowments
  5. property and casualty
- referred to as non-life or general outside the US

6. health
7. managed care
8. disability
9. flood insurance
10. dental
11. utilization management
12. long-term care
13. other

#### 2. Pensions

1. qualified plans
2. individual retirement plans
3. savings plans
4. vesting
5. fiduciaries
6. annuities

#### 3. Reinsurance

-when an insurance company buys insurance from another company; either when the applicant wants a greater death benefit or there is greater risk for the company  
-proportional and non-proportional plans

### 2. Processes

#### 1. Risk Management

1. reinsurance
2. reserves
3. asset/liability management

- 4. investments
- 5. actuarial
- 2. Underwriting**
- 3. Treasury Operations**
  - cash management
- 4. Back-office Operations**
- 5. Proof/Items Processing and Settlement**
- 6. Claims**
- 7. Policy Loans**
- 8. Marketing Sales and Distribution**
  - insurance agencies
- 9. Mergers and Acquisitions**

# III. Securities

## 1. Products

### 1. Trusts

1. Personal
2. Corporate
3. Employee Benefits
4. Transfer/Registrar

### 2. Annuities

1. Fixed
2. Variable
3. Real Estate

### 3. Derivatives

1. Swaps
2. Options
3. Other Components
  - structured, credit, interest, futures, forwards

### 4. Stocks

1. Common
2. Preferred
3. Warrants
4. Debt Securities
5. Options

### 5. Bonds

1. Convertible
2. Straight

### 6. Commodities

### 7. Mutual Funds

1. Income
2. Stock
3. Growth
4. Balanced Funds
5. Specialized Funds

### 8. Capital Market Products

1. Real Estate Investment Trust
2. Repurchase Agreements

### 9. Securities Lending

### 10. Asset Management

- supervision of fund managers' portfolios and valuations

### 11. Money Market Products

## 2. Processes



**1. Risk Management**

1. Trading Market Risk
2. Asset/Liability Management
3. Reserves

**2. Underwriting**

1. Securities
2. IPOs

**3. Securitizations****4. Treasury Operations****5. Back-office Operations****6. Marketing Sales and Distributions**

-brokers

**7. Investments****8. Broker/Dealer Activities****9. Mergers and Acquisitions**

# IV. Regulation

## Banking

### **2. Laws/Regulations and Regulatory Environment**

#### **1. Overview of the Regulatory Environment**

1. Federal Reserve System
2. Office of the Comptroller of the Currency
3. FDIC
4. State Regulatory Systems
5. National Credit Union Administration NUCA

#### **2. Laws and Regulations**

Regulation A- Borrowing by Depository Institutions

Regulation B- Equal Credit Opportunity Act

Regulation C- Home Mortgage Disclosure Act

Regulation D- Reserve Requirements

Regulation E- Electronic Funds Transfer Act

Regulation F- Limitations on Interbank Liabilities

Regulation G- Disclosure and Reporting of CRA-related Agreements

Regulation H- Membership of State Banking Institutions in the Federal Reserve System

Regulation I- Issue and Cancellation of Capital Stock of Federal Reserve Banks

Regulation J- Collection of Checks and Other Items

Regulation K- Edge Act

Regulation L- Interlocks Act

Regulation M- Consumer Leasing

Regulation N- Relationships with Foreign Banks and Bankers

Regulation O- Loans to Executive Officers

Regulation P- Bank Protection Act

Regulation Q- Interest on Deposits

Regulation S- Reimbursement for Providing Financial Records

Regulation T- Credit by Brokers and Dealers

Regulation U- Credit by Banks for Purchase of Margin Stocks

Regulation V- Fair Credit Reporting

Regulation W- Transactions Between Member Banks and Their Affiliates

Regulation Y- Bank Holding Company Act

Regulation Z- Truth in Lending

Regulation AA

Regulation BB- Community Reinvestment Act

Regulation CC- Availability of Funds and Collection of Checks

Regulation DD- Truth in Savings

Regulation EE- Netting Eligibility for Financial Institutions

Regulation FF- Obtaining and Using Medical Information in Connection with Credit

## **2. Laws/Regulations and Regulatory Environment**

### **1. Overview of the Regulatory Environment**

#### **1. Federal Reserve System**

- banks must purchase stocks of other banks to be members of the FRS; depends on size
- see above section

#### **2. Office of the Comptroller of the Currency**

- charters, regulates, and supervises all national banks and branches of foreign banks

- DC headquarters with 6 district offices and a London office

- established in 1863 as an office of the Treasury; comptroller is appointed by president for a 5 year term; comptroller is also director of the FDIC and Neighbourhood Reinvestment Corporation

- provides onsite reviews of banks and issues rules; has access to all the bank's records

- the National Bank act re-commissioned the office; the Civil War was why the government issued national currency; today the OCC regulates 2,600 banks having 58% of the US commercial bank assets

- funding comes wholly from assessments on national banks; also receives interest income from US Treasury securities

#### **Standard for Developing Regulations**

- issues risk-focused and results-focused regulations

- also issues differential regulations for specific banks; some are based on CAMEL

- CAMEL: capital adequacy, asset quality, management, earnings, liquidity; not publicly viewable

- CRA ratings: community reinvestment act; outstanding, satisfactory, needs to improve, substantial noncompliance

- sometimes banks must consult the OCC before expanding their business operations

- OCC coordinates with other agencies as well for better regulation formation

- OCC allows 60 days for public feedback

- also has many traditional mechanisms for feedback

#### **3. FDIC**

- since 1933 ensures stability and confidence in the banking system

- ensures deposits up to 100,000 and helps failing banks

- 5 member board of directors appointed by the president

- administers 2 deposit funds: bank insurance fund BIF and savings association insurance fund SAIF

- the BIF is the main one, and the SAIF was created from the S&L scandal

- gets their funding from member deposit insurance premiums

- must use the least costly approach to resolving failing banks

- only protects deposits, not securities

- FDIC is primary regulator of state non-member banks and is backup administrator for the other member banks

- examinations and preventative methods are the main way they prevent issues
- examinations conducted: CRA, compliance, information systems and E-banking, safety and soundness, trust, laws and regulations, examiner training program, consumer affairs program and publications, community affairs program

#### **4. State Regulatory Systems**

- all states have different regulations, so they have little importance

#### **5. National Credit Union Administration NUCA**

- independent federal agency that supervises and insures 6,707 federal credit unions and insures 4,134 state-chartered credit unions

- entirely funded by credit unions and receives no tax dollars

- independent financial regulatory agency of the federal government; also insures state credit unions which qualify

## **2. Laws and Regulations**

### **Regulation A- Borrowing by Depository Institutions**

- relates to extensions of credit by Fed Reserve Banks to depository institutions and others; established rules under which the Fed banks can extend credit to depository institutions and others

- allows: adjustment (short-term), extended (long-term), and emergency (economic issues) credits

### **Regulation B- Equal Credit Opportunity Act**

- prohibits discrimination and must give notice of: action, credit collections of information, retention of credit information, race for certain dwellings, copies

### **Regulation C- Home Mortgage Disclosure Act**

- provides public with information, help public officials distribute public-sector investment to attract private sector investment, and to help identify discriminatory practices

- requires certain lenders to track home loans and refinancings

### **Regulation D- Reserve Requirements**

- relates to reserve requirements; also provides guidance on NOW account eligibility, MMDA and savings account transfer restrictions, and early withdrawal penalties

### **Regulation E- Electronic Funds Transfer Act**

- protects consumers using EFT; establishes basic right, liabilities, and responsibilities of consumers of financial institutions using EFT

### **Regulation F- Limitations on Interbank Liabilities**

- limits the risks that the failure of a depository institution would have on other depository institutions; provides requirements relating to interbank liabilities

### **Regulation G- Disclosure and Reporting of CRA-related Agreements**

- disclosure and reporting of CRA-related agreements

### **Regulation H- Membership of State Banking Institutions in the Federal Reserve System**

- provides guidance on a variety of matters relating to state-chartered member banks, from real estate lending standards to standards for safety and soundness

### **Regulation I- Issue and Cancellation of Capital Stock of Federal Reserve Banks**

-implements the provisions of the Federal Reserve Act relating to the issuance and cancellation of Federal Reserve Bank stock or ceasing to be a member bank, or upon changes in the capital and surplus of a member bank of the Fed

**Regulation J- Collection of Checks and Other Items**

-governs the collection of checks and other cash and non-cash items and the handling of returned checks by the Fed Reserve Banks and provides rules for collecting and returning items and settling balances

**Regulation K- Edge Act**

-sets out rules governing the international and foreign activities of US banks, including procedures for establishing foreign branches and Edge corporations to engage in international banking and for investments in foreign organizations

**Regulation L- Interlocks Act**

-designed to foster competition in the banking industry by limiting the sharing of banking personnel; management official can't serve in a management capacity of 2 institutions in the same community

**Regulation M- Consumer Leasing**

-implements the consumer lending provisions of the Truth in Lending Act

**Regulation N- Relationships with Foreign Banks and Bankers**

-governs relationships and transactions between Federal Reserve Banks and foreign banks or groups of foreign banks, or bankers, or a foreign state

**Regulation O- Loans to Executive Officers**

-governs extensions of credit to insiders, which includes directors, officers, and principal shareholders of a bank and its affiliates; includes special restrictions on loans to executive officers

**Regulation P- Bank Protection Act**

-requires a financial institution to provide notice to customers about its privacy policies and practices, describes the conditions under which a financial institution may disclose non-public personal information about consumers to non-affiliated 3<sup>rd</sup> parties; and provides a method for consumers to prevent a financial institution from disclosing that information to most non-affiliated 3<sup>rd</sup> parties by opting out of that disclosure

**Regulation Q- Interest on Deposits**

-provides guidelines and restrictions relating to interest on deposits and advertising

**Regulation S- Reimbursement for Providing Financial Records**

-establishes the rates and conditions for reimbursement of reasonably necessary costs directly incurred by financial institutions in assembling or providing customer financial records to a government pursuant to the Right to Financial Privacy Act

**Regulation T- Credit by Brokers and Dealers**

-regulates extensions of credit by brokers and dealers; it imposes, among other obligations, initial margin requirements and payment rules on certain securities transactions

**Regulation U- Credit by Banks for Purchase of Margin Stocks**

-imposes credit restrictions upon persons other than brokers or dealers that extend credit for the purpose of buying or carrying margin stock if the credit is secured directly or indirectly by margin stock

**Regulation V- Fair Credit Reporting**

-implements provisions of the Fair Credit Reporting Act FCRA; includes model notices that can be used to notify customers either before or immediately following the delivery of negative information

**Regulation W- Transactions Between Member Banks and Their Affiliates**

-implements Sections 23A and 23B of the Federal Reserve Act which govern most transactions between banks and their affiliates; the term banks includes all national banks, as well as insured state member and nonmember banks, and for certain purposes, US branches and agencies of foreign banks

**Regulation Y- Bank Holding Company Act**

-regulates the acquisition of control of banks by companies and individuals; defines and regulates the nonbanking activities in which bank holding companies and foreign banking organizations with US operations may engage; and sets forth the procedures for securing approval for these transactions and activities

-the Bank Holding Company Act of 1956 was designed to control interstate banking activities by requiring that the state being expanded into specifically allowed the formation of an interstate bank

**Regulation Z- Truth in Lending**

-designed to help consumers comparison shop for credit by requiring disclosures about its terms and cost; gives consumers the right to cancel certain credit transactions that involve a lien on a consumer's principal dwelling, regulates certain credit card practices, and provides a means for fair and timely resolution of credit billing disputes; also requires a maximum interest rate to be stated in variable-rate contracts secured by the consumer's dwelling; imposes limits on certain home equity and mortgages

**Regulation AA**

-establishes consumer complaint procedures; defines unfair or deceptive acts or practices of banks in connection with extensions of credit to consumers; prohibits certain practices, such as taking a non-purchase money security interest in household goods

**Regulation BB- Community Reinvestment Act**

-purpose is to assess an institution's record of helping to meet the credit needs of the local communities in which the institution is chartered, consistent with the safe and sound operations of the institution, and to take this record into account in the agency's evaluation of an applicant for a deposit facility by the institution

**Regulation CC- Availability of Funds and Collection of Checks**

-contains rules regarding the duty of banks to make funds deposited into accounts available for withdrawal, including availability schedules plus rules regarding exceptions to the schedules, disclosure of funds availability policies, payment of interest, and liability; contains rules to expedite the collection and return of checks by banks, including the direct return of checks, the manner in which the paying bank and returning banks must return checks to the depository bank, notification of non-payment by the paying bank, endorsement and presentment of checks, same-day settlement for certain checks

**Regulation DD- Truth in Savings**

-purpose is to enable consumers to make informed decisions about accounts at depository institutions; requires depository institutions to provide disclosures so that consumers can make meaningful comparisons among depository institutions

**Regulation EE- Netting Eligibility for Financial Institutions**

-expands the FDIC Improvement Act of 1991 definition of a financial institution for financial market participants who avail themselves of the netting provisions of the Act regarding contracts in which the parties agree to pay or receive the net, rather than the gross payment due

### **Regulation FF- Obtaining and Using Medical Information in Connection with Credit**

-extends the rules on obtaining and using medical information in connection with credit to creditors other than those regulated by the OCC, FRB, FDIC, OTS, NCUA

### **Regulation X- HUD**

-implements the provisions of the Real Estate Settlement Procedures Act RESPA

## **Banking Laws**

### **1. National Bank Act 1864**

-established a national banking system and the chartering of national banks

### **2. Federal Reserve Act 1913**

-established the Federal Reserve System as the central banking system of the US

### **3. McFadden Act 1927**

-amended national banking laws and the Federal Reserve Act; prohibited interstate banking

### **4. Banking Act 1933**

-Glass-Steagall Act; established FDIC as temporary agency; separated commercial banking from investment banking

### **5. Banking Act 1935**

-established the FDIC as a permanent agency of the government

### **6. FDIC Act 1950**

-revised and consolidated earlier FDIC legislation into 1 act; embodied the basic authority for the operation of the FDIC

### **7. Bank Holding Company Act 1956**

-required Federal Reserve Board approval for establishment of a bank holding company; prohibited bank holding companies headquartered in 1 state from acquiring a bank in another state

### **8. International Banking Act 1978**

-brought foreign banks within the federal regulatory framework; required deposit insurance for branches of foreign banks engaged in retail deposit taking in the US

### **9. Financial Institutions Regulatory and Interest Rate Control Act 1978**

-FIRIRCA; created the Federal Financial Institutions Examination Council; established limits and reporting requirements for bank insider transactions; created major statutory provisions regarding electronic fund transfers

### **10. Depository Institutions Deregulations and Monetary Act 1980**

-DIDMCA; established NOW accounts; began the phaseout of interest rate ceilings on deposits; established the Depository Institutions Deregulation Committee; granted new powers to thrift institutions; raised deposit insurance to 100,000

### **11. Depository Institutions Act 1982**

-Garn-St. Germain; expanded FDIC powers to assist troubled banks; established the New Worth Certificate Program; expanded the powers of thrift institutions

### **12. Competitive Equality Banking Act 1987**

-CEBA; established new standards for expedited funds availability; recapitalized the Federal Savings & Loan Insurance Company FSLIC; expanded FDIC authority for open bank assistance transactions, including bridge banks

### **13. Financial Institutions Reform, Recovery, and Enforcement Act 1989**

-FIRREA; purpose was to restore public confidence in savings and loan industry; abolished the Federal Savings & Loan Corporation FSLIC, giving the FDIC the power of insuring savings and thrifts; SAIF for thrifts and BIF for banks; abolished the Federal Home Loan Bank Board, created Federal Housing Finance Board FHFB and the Office of Thrift Supervision OTS to replace it; created Resolution Trust Corporation RTC as a temporary agency for managing and disposing of failed banks; Resolution Funding Corporation RFC created to fund it

### **14. Crime Control Act 1990**

-title XXV, Comprehensive Thrift and Bank Fraud Prosecution and Taxpayer Recovery Act 1990, greatly expanded the power of Federal regulators to combat financial fraud; prohibited golden parachutes from underfunded banks; increased fines and penalties for bank fraud, gave regulators power to recover assets diverted during bank frauds, and allowed FDIC to take presumptive action

### **15. FDIC Improvement Act 1991**

-FDICIA; increased the powers of the FDIC; recapitalized the BIF allowed the FDIC to borrow from the Treasury; created Truth in Savings; ordered a least-cost resolution method for failing banks; restricted brokered deposits and solicitation of deposits and non-banking activities of insured state banks

### **16. Housing and Community Development Act 1992**

-established regulatory structure for government-sponsored enterprises GSE, combated money laundering, and provided regulatory relief to financial institutions

### **17. RTC Completion Act**

-requires the Resolution Trust Corporation RTC to adopt a series of management reforms and to implement provisions for bitches and niggers; lengthened statutory time for lawsuits, and provided for the transfer of RTC assets to the FDIC in 1995

### **18. Riegle Community Development and Regulatory Improvement Act 1994**

-established a Community Development Financial Institution Fund for funding for CDFIs; -aims at curbing reverse redlining, which is targeting insufficient people with abusive loans; relaxed capital requirements to encourage private sector secondary market trading of small business loans; reduces bank regulatory burden and paperwork requirements; reduces amount of currency transactions filed by financial institutions; shores up the Federal Flood Insurance Program

### **19. Riegle-Neal Interstate Banking and Branching Efficiency Act 1994**

-permits bank holding companies to acquire banks in any state after 1 year enactment requirement; increases statute of limitations for RTC

### **20. Economic Growth and Regulatory Paperwork Reduction Act 1996**

-modified flow of credit regulations for businesses and consumers; amended Truth in Lending Act and Real Estate Settlement Procedures Act 1974 to streamline mortgage lending process; amended FDIA to reduce regulatory burden and cost of credit; amended Fair Credit Reporting Act to strengthen consumer credit reporting protection; improved consumer credit repair protections; clarified lender liability and federal agency liability



issues under the CERCLA; allowed FDIC to levy special assessment for recapitalization of SAIF

### **21. Gramm-Leach-Bliley Act 1999**

-Financial Services Modernization Act; repeals last vestiges of Glass-Steagall Act 1933; allows super banks with restrictions on non-financial activities; restricts disclosure of non-public customer information by financial institutions, allows opt-out clauses by customers; banks need a satisfactory CRA rating to be formed; eased membership and restrictions for Federal Home Loan Bank System FHLB

### **22. International Money Laundering Abatement and Financial Anti-Terrorism Act 2001**

-prevents terrorists and others from using US financial system to move funds; provides for greater scrutiny for foreign banks with deposits and foreign persons with deposits; makes banks impose anti-money laundering standards and requires greater participation with the government in money laundering cases

### **23. SOX Act 2002**

-established PCOB; prohibits firms from providing other services to those they audit; requires CEOs and CFOs to verify financial statements; SEC can issue rules governing audits; insiders cannot trade stock during pension fund blackout periods; whistleblower protections and a ban on alteration of documents

### **24. Fair and Accurate Credit Transactions Act 2003**

-FACT contains admissions to the FCRA and helps prevent identify fraud and identifying victims; enhances consumer rights with regards to their credit; offers free credit reports to customers, and provides opt-out clauses

### **25. Office of Foreign Assets Control**

-OFAC of the US Department of the Treasury administers and enforces trade sanctions based on US foreign policy and national security goals relating to 'drugs' nukes and terrorists; acts under presidential wartime and emergency powers, and by special legislation to freeze assets; works with UN and international mandates

## Securities

1. Overview

### **2. Laws and Regulations**

1. Reserve Requirements

2. Insider Transactions

3. Self-assessment of Internal Controls/Risk Management

4. Investor Protection

5. Financial and Personal Information Privacy

6. Anti-money Laundering

### **3. Financial Markets**

1. Overview

i. Brokers and Dealers

ii. Types of Orders

iii. New Issues

iv. Clearing and Settlement Process

2. Stock Exchanges

3. OTC Market

4. Future and Options Markets

## **Insurance**

### **1. Overview**

-functions of the insurance regulators

### **2. Laws and Regulations**

1. Reserve Requirements
2. Financial and Personal Information Privacy
3. Self-assessment of Internal Controls/Risk Management
4. Securities and Exchange Commission

# Econometric s

Asset pricing or financial performance for research issues.

**I. Probability**

**II. Mathematics**

**III. Statistics**

**IV. Regression Analysis**

**4 primary areas of regression analysis**

1. Logistical regression/ qualitative response models
2. recursive methods for simultaneous equations
3. dynamic models/time series forecasting
4. panel data models

**Population and parameters > sampling distribution > statistic**

**Statistic > sampling distribution > population and parameters**

-applied econometrics cannot be done mechanically; it needs understanding, intuition, and skill

-we generally drive across bridges without worrying about the soundness of their construction because we are reasonably sure that someone rigorously checked their engineering principles and practice; economists must do likewise with models or else attach the warning 'not responsible if attempted use leads to collapse'

-economist's search for truth over the years has given rise to the view that economists are people searching in a dark room for a non-existent black cat; econometricians are regularly accused of finding 1

-it is a capital mistake to theorize before one has data; insensibly one begins to twist facts to suit theories, instead of theories to fit facts

**10 recommendations**

1. use common sense and economic theory
2. ask the right questions (put relevance before mathematical elegance)
3. know the context (do not perform ignorant statistical analysis)
4. inspect the data
5. do not worship complexity (KISS- keep it stochastically simple)
6. look long and hard at the results
7. beware the costs of data mining
8. be willing to compromise (do not worship textbook prescriptions)
9. do not confuse significance with substance (do not confuse statistical significance with practical significance)
10. confess in the presence of sensitivity (anticipate criticism)

**Non linear relationship**- the relationship between  $P_i$  and  $X_i$  is nonlinear; “one which approaches 0 at slower and slower rates as  $X_i$  gets small, and approaches 1 at slower and slower rates as  $X_i$  gets very large.”

**Linear relationship** –same incremental increase for the whole probability distribution

**Theory without practice is pointless. Practice without theory is mindless.**

### **Probability Density Functions PDF**

- 1) PDF discrete random variable
- 2) PDF continuous random variable
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- 6) Continuous PDF

### **Characteristics of probability distributions**

**\*moments**- characteristics: mean, variance, covariance, skewness, kurtosis

### **Probability Distributions**

- 1) normal
- 2) chi-squared
- 3) student's t distribution
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- 5) Bernoulli binomial distribution
- 6) Binomial distribution
- 7) Poisson distribution

### **Statistical Inference: Estimation**

- 1) Point estimation
- 2) Interval estimation

### **Methods**

- 1) OLS
- 2) Likelihood function
- 3) Method of moments

A) Small sample properties: unbiasedness, minimum variance, best unbiased, or efficient estimator, linearity, BLUE, minimum mean-square-error MSE estimator

B) Large sample properties: asymptotic unbiasedness, consistency, asymptotic efficiency, asymptotic normality

### **Statistical Inference: Hypothesis Testing**

- 1) Confidence interval approach
- 2) Test of significance approach

-do correlation analysis first; if correlations coefficients are close to -1 or +1, then regression analysis is useful; if they are close to 0, then regression analysis may not be meaningful

-upward sloping trend has a positive correlation coefficient

-downward sloping trend has a negative correlation coefficient

### **1. standard error of the estimates SE**

-represents a confidence range that gives us a range around the forecasted value within which we can be approximately 67% confident that the actual value of the unknown variable will fall; size of the standard error of the estimate must be interpreted in relationship to the average size of the dependent variable; if the SE is around 5-10% or less of the average size of the dependent variable, we can say the regression is precise

**2. coefficient of determination**- the square of the coefficient of correlation;  $R^2$ ; % of total amount of change in the dependent variable that can be explained by changes in the independent variable; high data points are close to the trend line; low data points are scattered; above .5 ok

-sampling is using less than 100% of the population

-must have sufficient evidential matter

**\*risk of incorrect acceptance**- is correct when it is actually wrong

**\*risk of incorrect rejection**- is wrong when it is actually correct

**\*risk of overreliance**- sample is too inclusive

**\*risk of underreliance**- sample is not inclusive enough

-some samples will be dual purpose

-attribute and variables sampling (substantive testing)

**\*discovery sampling**- used when a low error rate is expected; used for testing intentional errors or irregularities

-can use: mean-per-unit; difference estimation; or ratio approaches

**\*econometrics**- economic measurement

**\*deterministic**- exact relationship

**\*probabilistic**- deterministic model that includes a variable to measure the random error of the deterministic component

-need to add a disturbance, or error term:  $Y = B_1 + B_2X + U$

-consumption function for MPC where U is disturbance variable to allow for inexactness

-this is a linear regression model, or econometric model

-the dependent variable Y (consumption) is linearly related to the explanatory variable X (income), but the relationship between the 2 is not exact; subject to individual variety

**\*regression analysis**- gives us an estimation;  $\hat{Y}$

-can be simple (2 variables) or multiple (many variables)

**\*statistical inference, hypothesis testing**- confirmation or refutation of economic theories on the basis of sample evidence

-y is forecast, control variable and x is predictor, target variable

-forecast error is amount the model overpredicts by when estimating numbers for determinable causes



### **Anatomy of econometric modelling**

- 1) economic theory
- 2) mathematical model of theory
- 3) econometric model of theory
- 4) data
- 5) estimation of econometric model
- 6) hypothesis testing
- 7) forecasting or prediction
- 8) using the model for control or policy purposes

\***theoretical econometrics**- concerned with the development of appropriate methods for measuring economic relationships specified by econometric models; mathematical statistics; least squares

\***applied econometrics**- uses the tools of theoretical econometrics to study some special field of economics and business, such as the production function, investment function, demand and supply functions, portfolio theory

\***Markov property**- given the present state, all future states are independent of past states

-the present state fully captures all the information that could influence the future evolution of the process

-the *transition probabilities* indicate what the odds are of going from 1 state to another

### **BASICS of REGRESSION- MICROECONOMICS**

-least-squares criterion of best fit chooses best values for regression parameters, usually by minimising the sum of squared residuals between the actual values of the dependent variable and the fitted values

-**goodness of fit**- standard error of the regression- estimate of the standard deviation of the regression error; R-squared- % of the variation in the dependent variable that is accounted for by all the explanatory variables

## I. Single Equation Regression Models

### 1. Nature of Regression Analysis

-regression to mediocrity was the initial meaning of it; trying to predict population mean

\***scatter diagram, scattergram**- shows distribution of values in a hypothetical population corresponding to the given or fixed values

\***regression line**- shows the averages, goes through the middle in a straight line

-statistical, not deterministic or functional relationships in regression; means random or **stochastic**

-a statistical relationship itself cannot in itself imply causation

\***correlation analysis**- related to but not conceptually different from regression analysis; primary objective is to measure the strength or degree of linear association between 2 variables

\***correlation coefficient**- measures the strength of linear association

\***dependent variable**- explained, predictand, regressand, response, endogenous, outcome, controlled

\***independent variable**- explanatory, predictor, regressor, stimulus, exogenous, covariate, control

\***test statistic**- function on a sample

\***cross-sectional data**- collected at 1 point in time; i

-1 or more variables at the same point in time

-heterogeneity and the size or scale must be taken into account

\***time series data**- collected over time; t

-daily, weekly, monthly, quarterly, annually, quinquennially (5 years), decennially (10 years)

-presents problems for econometricians, because data is assumed to be **stationary**, which means that its mean and variance do not vary systematically over time

\***pooled**- combination of time series and cross-sectional

\***experimental**- variables are controlled

\***non-experimental**- variables are not controlled

-selectivity bias can lead to inaccurate data

-the researcher should always keep in mind that the results of research are only as good as the quality of the data

\***ratio scale**- ratio and distance are meaningful; X/Y and X-Y; natural ordering  $X > Y$

\***interval scale**- ordering and distance are meaningful, but not ratio; 2004/2005

\***ordinal scale**- natural ordering only

\***nominal scale**- just categories

### 2. 2-Variable Regression Analysis

-simplest regression analysis is **bivariate, or 2-variable regression**, where the dependent variable (regressand) is related to a single explanatory variable (regressor)

\***conditional expected values**- those which depend on the given values of the (conditioning) variable X; will be many

- $E(Y|X)$ , the expected value of Y given the value of X

\***unconditional expected value**- value does not depend on X; usually just 1 conglomerate

\***population regression line PRL, population regression curve, regression of Y on X**- the conditional mean or expected values all together in a line on the graph

\***conditional expectation function CEF, population regression function PRF, population regression PR**- the expected value of the distribution of Y given  $X_i$  is functionally related to  $X_i$ ; tells us how the means or average responses of Y varies with X;  $E(Y|X_i) = f(X_i)$

\***regression coefficients, intercept, slope coefficients**-  $\beta_1$  and  $\beta_2$

\* $E(Y|X_i) = \beta_1 + \beta_2 X_i$  - linear population regression function, linear population regression model, linear population regression, regression, regression equation, regression model

-linearity can be expressed in terms of variables or parameters

-usually add a stochastic disturbance or error term;  $Y_i = E(Y|X_i) + u$

-2 components to regression equation:

1)  $E(Y|X_i)$  – systematic or deterministic component

2)  $u_i$ - random, stochastic, or nonsystematic component

\***estimator, sample statistic**- a rule or formula or method that tells how to estimate the population parameter from the information provided by the sample at hand; gives us the **sample regression lines and stochastic sample regression functions**

-the same equation as the typical regression function, just the stochastic term is referred to as the **residual** term here

\***residuals**- deviations between actual data points and regression line : SSE

\***response surface**- graphical depiction of equation when more than 1 independent variable is in the regression equation; we can only imagine it

\***intercept**- average operating margin when all the independent variables are 0

$$Y_i = \beta_1 + \beta_2 X_i + u_i$$

-the SRF estimates the PRF; same function just theoretically the SRF comes first to ensure accuracy

### Diagnostics

1) Is the error variable nonnormal- draw a histogram

2) Is the error variance constant- plot residuals v. predicted values of y

3) Are the errors independent- (time-series data)- plot residuals v. time periods

4) Are there observations that are inaccurate or do not belong-

### 3. 2-Variable Regression Model: Problems with Estimation

\***Gauss-Markov theorem**- given the assumptions of the classical linear regression model, the least-squares estimators, in the class of unbiased linear estimators, have minimum variance; that is they are BLUE

\***best linear unbiasedness theory BLUE**- an estimator,  $\hat{\beta}$ , is said to be a best linear estimator of  $\beta$  if :**1)** is linear **2)** is unbiased **3)** has minimum variance in the class of all linear unbiased estimators of  $\beta$

\***number of degrees of freedom**- the sum of the residuals squared or the residual sum of squares RSS

\***goodness of fit**- how well the sample regression line fits the data

\***coefficient of determination**-  $r^2$ ; tells what proportion of the variation in the dependent variable, regressand, is explained by the explanatory variable, regressor

-how well the sample regression line fits the data

-portion or percentage of the total variation in  $Y$  explained by the regression model

-between 0 and 1; closer to 1, better the fit

\***coefficient of correlation**- a measure of the degree of association between 2 variables

-0 correlation doesn't necessarily imply causation

-between -1 and 1

\***monte carlo**- simulated; repeated sampling; computers

Venn diagram = Ballentin

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**Review**

\***random experiment**- an action or process that leads to one of several possible outcomes

\***population, sample space**- set of all possible outcomes of a random, or chance experiment

\***sample point**- each member of the sample space or population

\***simple event**- individual outcome of a sample space

\***event**- collection of simple events in the sample space

\***mutually exclusive**- events when the occurrence of 1 event precludes the occurrence of another event

\***exhaustive**- events that exhaust all possible outcomes of an experiment

**P(A)**- the probability of the event A; the proportion of times event A will occur in repeated trials of an experiment

\***relative frequency**- in  $n$  number of outcomes, with  $m$  successful, the ratio of  $m/n$   
-for large values of  $n$ , this relative frequency provides a very good approximation of the probability of A

\***random variable**- a variable whose value is determined by the outcome of a chance experiment

-usually denoted by capital letters, and the values taken by them are small letters; may be discrete or continuous

\***discrete**- takes on a finite number of values; dice roll

\***continuous**- takes on infinite values; height

\***probability distribution**- a table, formula, or graph that describes the random value and probability

**3 approaches to probability**

1) classical approach- chance, coin flips

2) relative frequency approach- long-run relative frequency

3) subjective approach- degree of belief

**Probability Trees**

-complement rule, multiplication rule (for independent events), addition rule (for mutually exclusive events): Bayes Law

**I. Probability Density Functions PDF**

- 2 requirements;  $f(x) > 0$  for all values between  $a$  and  $b$ ; total area under curve between  $a$  and  $b$  is 1.0

**1) PDF discrete random variable**

-the probability that the discrete random value  $X$  takes on the value of  $x$

**2) PDF continuous random variable**

-the probability that  $X$  lies in the interval  $a$  to  $b$

-the probability that  $X$  takes on a specific value is 0; probability for such a variable is measurable only over a given range or interval

**3) Joint PDF**

- probability of intersection
- gives the joint probability that X takes the value of x and Y takes on y

**4) Marginal PDF**

- calculated in the margins of the table
- the marginal, or individual PDFs of X and Y constitute the joint PDF

**5) Conditional PDF**

- one event given another, combination; independence and union
- tells us the probability of 1 variable conditional on the values of another variable
- gives the probability that X takes on x given that Y has the assumed value of y
- the conditional PDF of 1 variable can be expressed as a ratio of the joint PDF to the marginal PDF of another (conditioning) variable

**6) Statistical Independence**

- 2 random variables are statistically independent if the joint PDF can be expressed as the product of the marginal PDFs

**7) Continuous PDF****II. Characteristics of probability distributions**

**\*moments**- characteristics: mean, variance, covariance, skewness, kurtosis

-standard deviation, min and max values, median

**a. mean, expected value-**

**b. variance-** the distribution or spread of the X values around the expected value

-when comparing variances between data sets, a higher variance means more variation in the observations

**c. standard deviation-** positive square root of the variance; gives an indication of how closely or widely the individual X values are spread around their mean value

**d. covariance-** variance between 2 variables; the variance of a variable is the covariance of that variable with itself

**e. correlation coefficient-** linear association between 2 variables; lies between -1 and +1; perfect negative and perfect positive association

**d. skewness, S-** lack of symmetry

**e. kurtosis, K-** tallness or flatness

-less than 3 are platykurtic (fat or short-tailed)

-greater than 3 are leptokurtic (slim or long-tailed)

-equal to 3 is mesokurtic (normal distribution)

**g. min, max-**

**h. median**

**\*standard error-** standard deviation of the sampling distribution

**\*coefficient of variation-** the standard deviation of the observations divided by their mean; variability measure, larger means mean less variability

### Measures of central location

- 1) arithmetic mean
- 2) median
- 3) mode

### Measures of variability

- 1) variance
- 2) range
- 3) standard deviation
- 4) coefficient of variation
- 5) MAD

### Measures of relative standing

- 1) percentile
- 2) interquartile range

### Measures of linear relationship

- 1) covariance
- 2) coefficient of correlation

## III. Probability Distributions

**\*univariate distribution-** distribution of 1 variable

**\*bivariate distribution-** probabilities of combinations of 2 variables

### 1) normal

-utilizes the  $z$  value; bell shaped

-exponential distribution is an option

**a.** it is symmetrical around its mean value

**b.** 68% within  $1\sigma$ ; 95% within  $2\sigma$ ; 99.7% within  $3\sigma$

**c.** normal distribution depends on 2 parameters:  $\mu$  and  $\sigma^2$ ; we can find the probability that  $x$  lies within a specific interval: convert these 3 variables into a **standardized**

**normal variable  $Z$**

**d.** a linear combination of normally distributed variables is itself normally distributed

**e. central limit theorem-**  $X$  approaches the normal distribution with mean  $\mu$  and variance  $\sigma^2/n$ ; that is,  $Z$  is a standardized normal variable

**f.** all odd-powered moments around the mean value of a normally distributed variable are 0

**g.** for a normal PDF: skewness = 0 and kurtosis = 3; that is, a normal distribution is symmetric and mesokurtic

**\*Jarque-Bera JB test of normality-** checks to see if skewness = 0 and kurtosis = 3; distributed as a chi-square statistic with 2df

**h.** the mean and variance of a normally distributed random variable are independent in that 1 is not a function of the other



**\*Chebysheff's theorem**- used when histogram is not bell shaped; slightly different distributions; 75% for 2 std. and 90% for 3 std.

## 2) chi-squared

-used to infer about the population variance

-shape depends on degrees of freedom

-the quantity possesses the chi-squared distribution with  $k$  degrees of freedom when the  $df$  means the number of independent quantities in the previous sum

**a.** is a skewed distribution; the degree of skewness depends on  $df$

-for little  $df$ , the distribution is highly skewed to the right

-as the  $df$  increases, the  $df$  the distribution becomes increasingly symmetrical

-when  $df$  exceeds 100, the variable can be treated as a standardized normal variable

**b.** the mean of the chi-squared distribution is  $k$ , and variance is  $2k$ , where  $k$  is  $df$

**c.** if  $Z_1$  and  $Z_2$  are independent chi-squared variables with  $k_1$  and  $k_2$   $df$ , then  $Z_1 + Z_2$  is a chi-squared with  $df = k_1 + k_2$

## 3) student's t distribution

-used when the sample standard deviation is unknown

**\*robust**- if the population is nonnormal, the results of the t-test and confidence interval estimate are still valid provided that the population is not extremely nonnormal

-mound shaped whereas normal is bell shaped

-is symmetrical around mean like normal, both random variables have mean of 0; similar values to normal

-shape depends on degrees of freedom

-used when we have an unknown standard deviation to get interval estimate of population mean

-standard  $Z$  values correspond to the infinite  $DF$ 's in the  $t$  table; more than 100  $dfs$

-as the degrees of freedom increases, the distance between the  $t$  distribution and standard normal distribution becomes smaller

**a.** the  $t$ -distribution, like the normal, is symmetrical, but is flatter than the normal; but as the  $df$  increases, the  $t$  distribution approximates the normal distribution

**b.** the mean of the  $t$  distribution is 0, and its variance is  $k/(k-2)$

**\*degrees of freedom**- the number of independent pieces of information that go onto the computation of variance; but we need  $n-1$  because variance = 0

## 4) F distribution- Fisher's

-mean is equal to 1; shape depends on 2 degrees of freedom

-involves 2 variables-  $Z_1$  and  $Z_2$

**a.** like the chi-squared, the  $F$ -distribution is skewed to the right; but as  $k_1$  and  $k_2$  become large, it approximates the normal distribution

**b.** the mean value is  $k_2/(k_2-2)$ , and its variance is page 893

**c.** the square of a  $t$ -distributed random variable with  $k$   $df$  has an  $F$  distribution with 1 and  $k$   $df$

**d.** for fairly large denominators  $df$ , the numerator  $df$  times the  $f$  value is approximately the same as chi-squared value with numerator  $df$

-the t, chi-square, and f are all distributions related to the normal

**5) Bernoulli binomial distribution**

-p = successes and (p=1) is failures

-insert formula

**6) Binomial distribution**

-is the generalization of the Bernoulli

\***cumulative probability**- probability of all values less than X; binomial tables

**7) Poisson distribution**

-like the binomial, is the occurrence of events, or successes

-depends on a single parameter  $\lambda$

-its variance is equal to its expected value,  $\lambda$

-used to model rare or infrequent phenomena

## IV. Statistical Inference: Estimation

**\*problem of estimation-** we can assume a variable  $X$  assumes a particular probability distribution, but we need the values of the parameters, mean and variance

-so we have a random sample of size  $n$  from the known probability distribution and use the sample data to estimate the unknown parameters

-this problem has 2 categories

**\*unbiased estimator-** an estimator whose expected value is equal to that parameter

**\*consistency-** unbiased estimator is when the difference between the estimator and the parameter grows smaller as the sample size grows larger

**\*relative efficiency-** when there are 2 unbiased estimators, the one whose variance is smaller is said to be relatively efficient

### 1) Point estimation

-get a statistic or estimate known as the point estimator

### 2) Interval estimation

-get a sampling or probability distribution of an estimator

-from an  $\alpha$  of .05, we get a confidence interval with a 95% confidence coefficient

- $\alpha$  is the level of significance, or the probability of committing a Type I error

-so we construct an interval around the point estimator, 3 standard errors on either side, to give us a 95% chance of containing the true parameter value

## *Methods*

### 1) Ordinary least squares OLS-

-produces a straight line drawn through the points so that the sum of the squared deviations between the points and the line is minimized

**-CLRM:** makes no assumption about the probability distribution of  $u$

-most widely used

-precision of is measured by standard errors

**\*standard error-** the standard deviation of the  $Y$  values (sampling distribution) around the estimated regression line

-often used as a summary measure of the goodness of fit of the estimated regression line

**\*sampling distribution-** of an estimator is simply a probability or frequency distribution of the estimator; a distribution of the set of values of the estimator obtained from all possible samples of the same size from a given population

-goodness of fit is measured by coefficient of determination,  $r^2$

-since data changes from sample to sample, need precision or reliability of the estimators,  $\beta_1$  and  $\beta_2$

### Numerical properties

-hold as a consequence of use of OLS, regardless of how the data were generated

- 1) the OLS estimators are expressed solely in terms of the observable, or sample, quantities
- 2) they are point estimators; that is, given the sample, each estimator will provide only a single point value of the relevant population parameter
- 3) once the OLS estimates are obtained from the sample data, the sample regression line can be easily obtained

### **Statistical properties**

- hold only under certain assumptions about the way the data were generated
  - classical linear regression model; Gaussian standard
  - is a conditional regression analysis; conditional on the values of the regressor X
- 1) linear regression model;
    - nonlinearity in parameters**
  - 2) X values are fixed in repeated sampling;
    - stochastic regressors**
  - 3) 0 mean value of disturbance  $u$ 
    - nonzero mean of  $u$**
  - 4) homoscedasticity, or equal variance of  $u$ 
    - heteroscedasticity- when the variance of the error variable is not constant**
  - 5) no autocorrelation between the disturbances
    - not positively or negatively correlated
    - \***Durbin-Watson test**- tests for 1<sup>st</sup> order auto correlation
    - autocorrelated disturbances**
  - 6) 0 covariance between  $u$  and X
    - nonzero covariance between disturbances and regressor**
  - 7) the number of observations  $n$  must be greater than the number of parameters to be estimated
    - sample observations less than the number of regressors**
  - 8) variability in X values
    - insufficient variability in regressors**
  - 9) the regression model is correctly specified; no specification error or bias
    - correct model and variables
    - specification bias**
  - 10) there is no perfect multicollinearity
    - collinearity or intercorrelation
    - if variables are linearly related to each other, no point in including them both
    - when the independent variables are correlated with each other
    - multicollinearity**
  - 11) normality of disturbances term  $u$ 
    - nonnormality of disturbances**
- 4 tests
1. histogram of residuals
    - simple graphic device
  2. normal probability plot NNP
    - graphical device; uses special paper; equally simple
  3. Anderson-Darling normality test- A-squared statistic

#### 4. Jacque-Bera test-

- asymptotic, large sample test
- based on OLS residuals; computes kurtosis and skewness
- when the p-value of these statistics is high, do not reject the null there is normality
- t, F, and chi-squared distributions require the normality assumption

**\*finite sample properties-** hold regardless of the sample size on which the estimators are based

-above 11

**\*asymptotic properties-** hold only if the sample size is very large; technically infinite

**\*historical regression-** can be used to predict or forecast

##### 1. mean prediction

-gets the confidence interval or confidence band

##### 2. individual prediction

-predicts individual value of Y

-one should exercise great caution in “extrapolating” the historical regression line to predict Y when the given X is far removed from the sample mean X

#### Evaluate results

1. are the signs of the estimated coefficients in line theoretical or prior expectations
2. if theory says the relationship should be positive and statistically significant, is that so
3. how well does the model explain the variation in the dependent variable; r-squared
4. check for assumptions of CNLRM

#### Extensions of the 2-variable linear regression model

##### 1) regression through the origin

-intercept term is absent or 0

$$Y_i = \beta_2 X_i + \mu_i$$

\*raw r-squared- used instead of r-squared; but not as good, usually not used

-not used often; when the intercept is nearly 0, we basically have this anyways

##### **A. Market model**

##### **B. CAPM**

##### **C. Freidman’s permanent income hypothesis**

-permanent consumption is proportional to permanent income

##### **D. cost analysis**

-variable cost of production is proportional to output

##### **E. monetarist theory**

-the rate of change of prices (inflation), is proportional to the rate of change of the monetary supply

##### 2) units of measurement

-utilizes scales to equalize billions to millions

-not practical, because you can change it on your own

-slope= units of the dependent variable / units of the explanatory variable

**3) standardized variables**- when we subtract the mean value of the variable from its individual values and divide the difference by the standard deviation of that variable  
 -their mean value is always 0 and its standard deviation is always 1  
 -this is a regression through the origin; the  $\beta$  coefficients are the regression coefficients  
 -we measure the effect in standard deviation units  
 -advantage for large samples; like using log to standardize

#### 4) functional form

-these models may be nonlinear in the variables, but are linear in the parameters, or can be made so through suitable transformations of the variables  
 -conversely, most models are linear in the parameters, but may not be in the variables

#### A. log-linear model

$$\ln Y_i = \ln \beta_1 + \ln \beta_2 t + \mu_i$$

-offshoot of the exponential regression model  
 -to measure elasticity  
 -constant elasticity model, log-log, double-log, or log-linear  
 -to see if it fits the data, plot a scatter plot and see if there is a linear relationship

#### B. semi-log model

**1. log-lin model**- used to measure growth rate; regressand is logarithmic

-% growth in Y for an absolute change in X

$$\ln Y_i = \beta_1 + \beta_2 t + \mu_i$$

-2 types= growth rate (relative) and linear trend (absolute); depends on which change is needed; growth and relative changes is more practical

-the slope coefficient measures the constant proportional or relative change in Y for a given absolute change in the value of the regressor

$\beta_2$  = relative change in regressand/ absolute change in regressor

-also known as the semi-elasticity of Y with respect to X

-gives the instantaneous and compound rates of growth

**\*linear trend model**- instead of regressing the log of Y on time, regress Y on time

$$Y_i = \beta_1 + \beta_2 t + \mu_i$$

**2. lin-log model**- regressors are logarithmic

-absolute change in Y for a % change in X

$$Y_i = \beta_1 + \beta_2 \ln X_i + \mu_i$$

$\beta_2$  = change in Y/ change in  $\ln X$  (relative change in X)

-a change in the log of a number is a relative change

**\*Engel expenditure models**- the total expenditure that is devoted to food tends to increase in arithmetic progression as total expenditure increases in geometric progression

#### C. reciprocal model

-as X increases indefinitely,  $\beta_2(1/X_i)$  approaches 0 and Y approaches the limiting or asymptotic value  $\beta_1$

-and so these models have a asymptote or limit value that the dependent variable will take when the value of the X variable increases indefinitely

$$Y_i = \beta_1 + \beta_2(1/X_i) + \mu_i$$

-as GDP increases indefinitely, child mortality reaches its highest possible value

\***Phillips curve**- asymmetry in response of wage changes to level of the unemployment rate

\*modified Phillips curve

\***expectations-augmented**- to indicate that  $\pi_{t-1}$  stands for expected inflation

\***celeratonist**- to suggest how a low unemployment rate leads to an increase in the inflation rate and hence an acceleration of the price level

#### **D. logarithmic reciprocal model, log hyperbola model**

$$\ln Y_i = \beta_1 + \beta_2(1/X_i) + \mu_i$$

-initially Y increases at an increasing rate (convex), then increases at a decreasing rate (concave)

-good for short-run production functions; labour and capital function

#### **Guidelines for model choice**

1. the underlying theory may suggest a particular functional form (Phillips curve)
2. find the rate of change(slope) of the regressand to regressor; use the formulas; elasticity of coefficients
3. coefficients chosen should satisfy certain a priori expectations; what we would normally expect
4. more than 1 model may fit; when comparing r-squared values for model fit, make sure that the regressand is the same; the regressor's can take any form
5. higher r-squared does not guarantee a better fit; more variables raise the r-squared; most important is theoretical underpinning of chosen model, signs of regressors, and their statistical significance

-multiplicative error terms are intrinsically linear (in-parameter); can take the log

-additive error terms are intrinsically non-linear(in-parameter); cannot take the log

#### **3-variable regression models**

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i + \mu_i$$

-linearity refers to in the parameters and not necessarily in the variables

\***partial regression coefficients**-  $\beta_2$  measures the change in mean value of Y per unit change in  $X_2$

-gives net effects on Y

\***correlation coefficients of 0 order, gross or simple correlation coefficients**- between the multiple variables

\***partial correlation coefficients**- correlation coefficient that is independent of the extra regressor in on  $X_2$  and Y

\*coefficient of partial determination- proportion of the variation in Y not explained by the variable  $X_3$  that has been explained by the inclusion of  $X_2$  into the model; similar to  $R^2$

\***multiple correlation coefficients**-  $R^2$  opposed to  $r^2$

-Goldberger's modified  $R^2$

\***Cobb-Douglas production function**- 2 variable log-linear model

**\*polynomial regression model-** relate to cost and production functions

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 X_i^2 + \mu_i$$

-increasing and decreasing function

-if all we need is point estimation of the parameters of the regression model, then the method of OLS which does not make any assumption about the probability distribution of the disturbance  $u$  will suffice; if we need estimation as well as inference, then we need to assume that  $u$  follows a probability distribution

-testing the individual significance of a partial regression coefficient (t-test) and testing the overall significance of the regression (r-squared) are different

F-test can test several things: 1) whether an individual regression coefficient is statistically significant 2) all partial slope coefficients are 0 3) 2 or more coefficients are statistically equal 4) the coefficients satisfy some linear restrictions 5) there is a structural stability of the regression model

### Adding or subtracting variables

-ANOVA and F-tests can be used to determine if variables contribute

R-squared will increase for the model if adding the variable if the variable's F-value is greater than 1

### Restricted least squares

-when economic theory suggests that the coefficients in a regression model satisfy some linear equality restrictions; Cobb-Douglas function

**\*restricted least squares-** can be generalized to models containing any number of explanatory variables and more than 1 linear equality restriction

### Structural changes in data

-values of the parameters do not of the model do not remain the same throughout the entire time period; pooled regression may not be sufficient

**Chow test-** assumes the error terms in the sub-period regressions are normally distributed with the same (homoscedastic) variance; the 2 error terms are independently distributed

-must know the exact time of the change; can handle more than 1 structural break

1. the assumptions underlying the test must be fulfilled; error variances must be the same
2. will only tell us if the 2 regressions are different; not what is different: intercepts, slope, or both

3. assumes we know the points of the structural break

**\*recursive residual test-** allows for a better regime switching model

### **Troika of hypothesis tests**

#### **1) likelihood test**

-gives the LR ratio; this a combination of the restricted log-likelihood function RLLF and the unrestricted log-likelihood function ULLF

-if it is worth adding more variables, then the LLF's will be quite different

#### 2) Wald test

#### 3) Lagrange multiplier



-in asymptotically, large, samples, all 3 tests are equivalent in that the test statistic associated with each of these tests follows the chi-squared distribution  
 -for small samples the F-test suffices; for linear regression models no need to use these

**MacKinnon, White, Davidson test MWD-** used to determine whether a linear regression model or a log-linear regression model

**\*interaction term-** when a beta has 2 interaction terms

**\*transcendental production function TPF-** a generalization of the Cobb-Douglas production function; involves more terms than traditional

### **CAPM**

Stage I- time series regression

Stage II- cross-sectional regression

### **Dummy Variables**

-indicator, categorical, qualitative, dummy

-essentially are nominal scale variables

-these variables are a device to classify data into mutually exclusive categories such as male or female

-implicitly allow regressions of each subgroup

### ANOVA models with dummies

-regression that contains regressors that are all exclusively dummy in nature; opposed to T-test, which can only test 2 variables

### Caveats

**1) perfect collinearity, dummy variable trap-** exact linear relationship between the variables

-you must reduce dummy variables by 1 factor

-(m-1) variables are needed, not m

**2) base, benchmark, control, comparison, reference, omitted category-** the category for which no dummy variable is assigned

-all comparisons are made this category

3) intercept value  $\beta_1$  represents the mean value of the benchmark category

**4) differential intercept coefficients-** coefficients attached to the dummy variables; tell you how much the value of the intercept that receives the value of 1 differs from the intercept coefficient of the benchmark category

5) choice of benchmark is up to practitioner

6) can avoid dummy variable trap by eliminating intercept; use non-intercept option in regression

7) intercept method is more accepted and better

### ANCOVA, analysis of covariance with dummies

-contain an admixture of quantitative and qualitative variables

**\*quantitative regressors- covariates, control variables**

-as these results suggest, *ceteris paribus*(other conditions remaining the same)

### Dummies and the Chow Test

-structural changes; are they due to the slope or coefficients

**1. coincident regressions**- both the intercept and slope coefficients are the same in the 2 regressions

**2. parallel regressions**- only the intercepts in the 2 regressions are different, but the slopes are the same

**3. concurrent regressions**- the intercepts in the 2 regressions are the same, but the slopes are different

**4. dissimilar regressions**- both the intercepts and the slopes of the 2 regressions are different

\*differential intercept-

\***differential slope coefficient, slope drifter**- indicates by how much the slope coefficient of the second period's savings function (dummy equal 1)

\***additive form**- D added to X; enables us to distinguish between the intercepts of the 2 periods

\***interactive, multiplicative form**- D multiplied by X; enables us to differentiate between slope coefficients of the 2 periods

### Dummies and Interaction Effects

\***interaction dummy**- the product of 2 qualitative or dummy variables

-to account for interaction effects between dummy variables

-their effect on mean Y may be additive and multiplicative

### Dummies and Seasonal Analysis

-often important to remove the seasonal aspects and deseasonalize the data

-assign dummy variables for each quarter, with no intercept to avoid dummy trap

### Piecewise Linear Regression

-where we have 2 linear segments, with the function changing its slope at the threshold value

-type of spline function

\***knot**- threshold value, known in advance

\***spline functions**-piecewise polynomials of order k

### Panel Data Regression

-dummies can be used in panel regressions, as well as in cross-sectional, time series, and pooled

### Technical aspects of Dummies

**1. Semilog models**- in semilog models, dummies do not represent a % change in the regressand for a unit change in the regressor (semielasticity)

-instead, the intercept gives the mean log value and the “slope” coefficients give the difference in mean values between the 2 dummy values

## 2. Heteroscedasticity

## 3. Autocorrelation

4. **Dummy is dependent variable**- logit and probit models

\***polytomous dependent variable**- when the dependent variable can have more than 2 values

\***dichotomous dependent variable**- when the dependent variable can have only 1 of 2 values

## Other models

1. **random, varying parameters models**- assume that the parameters, the  $\beta$ 's, can be random, as opposed to just unknown but fixed

2. **switching regression models SRM**- treats the breakpoint as a random variable and through an iterative process determines when the break might have actually occurred

## 3. disequilibrium models

\***disequilibrium situations**- situations where markets do not clear; demand is not equal to supply

## 7 and 8 are usually taken for granted and not spelled out explicitly

-assumptions required for OLS to have desirable statistical properties (BLUE) and conditions required for OLS to be useful

-OLS is BLUE even if  $\epsilon$  is not met, but the standard errors of the OLS estimators will be large relative to their coefficients, making it difficult to assess the contribution of 1 or more regressors to the explained sum of squares

## 2 Major Problems with CLRM

### 1. those due to assumptions about the specification of the model and about the disturbances

1,2,3,4,5,9,11

3 major questions

1. How severe must the departure be for it to matter

-if  $u$  are not exactly normally distributed, what level of departure from this assumption can one accept before the BLUE property of the OLS estimators is destroyed

2. How do we find out if whether a particular assumption is in fact violated in a concrete case; normality tests: AD, chi-square, JB

-how do we find out if the disturbances are normally distributed in a given application

3. What remedial measures can we take if 1 or more of the assumptions are false

### 2. those due to assumptions about the data

6,7,8,10: data problems (outliers); errors in measurement

3 major questions

1. how serious is a particular problem

-is multicollinearity so severe that it makes estimation and inference very difficult

2. how do we find out the severity of the data problem
  - how do we decide whether the inclusion or exclusion of an observation that may represent outliers will make a difference in the analysis
3. can some of the data problems be easily remedied
  - can one have access to the original data to find out the sources of the errors of measurement in the data

### **2&6- fixed versus stochastic regressors**

- regressors are non stochastic and fixed in repeated sampling
- economists can not control the data they collect, unlike physical sciences; we rely on secondary data, collected by someone else: government or private party
- so we follow the practical assumption that the values of the explanatory variables are equally given even though the variables themselves may be intrinsically stochastic; results of the regression analysis are contingent upon these given values

- the X's cannot be regarded as truly fixed or nonstochastic
- u by assumption is fixed; then we must specify how the Xs and u's are distributed
- if we can make  $\epsilon$ , then we can proceed as if X's were nonstochastic

- of the X variables and u are uncorrelated contemporaneously means they are still consistent; if not instrumental variables can be used to obtain estimators in this situation

### **3: 0 mean value of u**

- if not fulfilled, we cannot estimate the original intercept; we get a biased estimate of intercept
- but many times, the intercept is not needed; this assumption does not affect the more meaningful slope coefficients

### **11: normality assumption**

- not essential if objective is estimation only
- OLS estimators are BLUE whether u are normally distributed or not
- but with normality assumption, we can determine that OLS estimators follow the normal distribution, that it has the  $\chi^2$  distribution, and one could use the t and F tests to test various statistical hypothesis regardless of sample size
- t and F tests will still be valid asymptotically, large samples, but not in finite or small samples

- but economists do not have the luxury of large-sample data; so the normality assumption becomes very important for hypothesis testing and prediction
- so given the twin problems of estimation and hypothesis testing, and small samples are the rule, we need to continue to use the normality assumption
- so we must explicitly test for the normality assumption; 3 tests

£9 – Model specification and diagnostic testing (13)

£1- (14)

1. nature of problem
2. examine its consequences
3. suggest methods of detecting it
4. remedial measures

### **Multicollinearity**

£7,8,10

£7- number of observations must be larger than the number of regressors

\***micronumerosity**- small sample size

£8- there be sufficient variability in the values of the regressors, for they are intimately related to the assumption of no multicollinearity

### **Nature of multicollinearity**

-includes perfect and less than perfect multicollinearity

-only technically includes linear relationships; variables could still be nonlinearly related

-if multicollinearity is perfect, then the regression coefficients of the X variables are indeterminate and their standard errors are infinite

-if multicollinearity is less than perfect, then the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy

### **Causes of**

1. the data collection method employed- limited sampling

2. constraints on the model or in the population being sampled- electricity consumption on income and house size

3. model specification- adding polynomial terms to a regression model; especially when the range of the X variables is small

4. overdetermined model- when the model has more explanatory variables than observations; medical studies

### **Estimation in the presence of perfect multicollinearity**

-one cannot get a unique solution for the individual regression coefficients; but one can get a unique solution for linear combinations of these coefficients

-pathological extreme

### **Estimation in the presence of high, or near perfect multicollinearity**

-there is generally no exact relationship among the X variables ever, especially in data involving economic time series

-so estimation of the coefficients may be possible

### **Theoretical consequences of**

-if the assumptions of the classical model are satisfied, then the OLS estimators of the regression are BLUE, or BUE if the normality assumption is added

-but even with near multicollinearity, OLS estimators will still be BLUE

-multicollinearity just makes it hard to get sample sizes with small standard errors; but so does small sample size and small variances

\***micronumerosity**- small sample size

-exact opposite of multicollinearity; exact micronumerosity (sample size is 0)

-but because we use secondary data, sample sizes may always be small

For any given sample:

1. LS estimators are unbiased with near multicollinearity; but unbiasedness is a multiple or repeated sample property; for any given sample we just do not know
2. the OLS estimator variance may not be small; even though all linear unbiased estimators have minimum variance (efficient)
3. multicollinearity is a sample phenomenon; same variables may not be related in the population

### **Practical consequences of**

1. large variances and covariances of OLS estimators

\***variance inflation factor**- the speed at which variances and covariances increase; tolerance is the inverse

2. wider confidence intervals

-leads to acceptance of "0 null hypothesis" more often

3. "insignificant" t ratios

-null hypothesis will be increasingly accepted

4. a high  $R^2$  but few significant t ratios

-so we could accept because of high  $R^2$  and F but reject because of insignificant t's

5. sensitivity of OLS estimators and their standard errors to small changes in the data

-as long as collinearity is not perfect, estimation of the regression coefficient is possible but the estimates and their standard errors become sensitive to even small changes in the data

### **Detection of**

1. is a question of the various degrees of , not kind

2. sample phenomenon; we don't test for it, just measure the degree of

### **Rules**

1. High  $R^2$  but few significant t ratios

-classic example; but, multicollinearity is considered harmful only when all of the influences of the explanatory variables on Y cannot be disentangled

2. High pair-wise correlations among regressors

-excess of .8, then it is a serious problem, but only with 2 variables; multi-variable no

3. examination of the partial coefficients

-no guarantee to work

4. auxiliary regressions

-regress the variables against each other

\***Klien's rule of thumb**- only if the auxiliary high  $R^2$  is higher than the original, is there an issue

5. Eigenvalues and condition index

-if k is between 100 and 1000, mild multicollinearity; above 1000 is it severe

6. tolerance and variance inflation factor

-larger the VIP, more troublesome; VIF exceeds 10,  $R^2$  exceeds .9, we have a problem

### **Remedial Actions**

1. do nothing

2. a priori information

3. combine cross-sectional and time-series data

4. drop a variable and specification bias

5. transformation of variables; ratio transformation

6. additional or new data

7. polynomial regressions

-if the explanatory variables are expressed in the deviation form, then it reduces;  
orthogonal polynomials: all uncorrelated with each other

other methods- factor analysis, principal components, ridge regression

-unless the collinearity continues in the future sample it is hazardous to use the estimated regression that has been plagued by multicollinearity for the purpose of forecasting

### **Autocorrelation**

£5- no auto, or serial correlation in the error terms

-no reason to assume that 1 unit is correlated to another in cross-sectional studies

\***spatial autocorrelation**- correlation in space rather than in time; when random units from the same random sample are correlated

-in cross-sectional analysis, the ordering of the data must have some logic, or economic interest, to make sense of whether (spatial) autocorrelation is present or not

-but in time series, the natural ordering of the successive observations are likely to exhibit intercorrelations, especially when the time interval is short

-similar to heteroscedasticity in that the usual OLS estimators, although linear, unbiased, and asymptotically, normally distributed, are no longer minimum variances among all linear unbiased estimators; they are not efficient relative to other linear and unbiased estimators; they may not be BLUE; as a result, the usual t, F, and  $X^2$  may not be valid

### **Nature of**

\***autocorrelation**- correlation between members of series of observations ordered in time or space; correlation between times series where v is u lagged by 1

\***serial correlation**- correlation between time series with 2 different time series

-classical model assumes that the disturbance term relating to any observation is not influenced by the disturbance term relating to any other observation

-so labour strikes in 1 quarter to do not carry over; and income effect on family consumption does not affect other families

-autocorrelation can be positive or negative; positive is when there is movement up or down over extended time periods, not quick movements

-most economic series have positive autocorrelation, as they move upward or downward over extended periods of time, as opposed to constant up and down movements

### **Why does autocorrelation occur?**

1. **inertia**- sluggishness

-time series data, such as inflation and interest rates, typically move up and down in segments, not independently

## **2. specification bias: excluded variables case**

-after the regression has been run, the residuals are plotted; they may seem as if variables which should have been included have not been

## **3. specification bias: incorrect functional form**

-using the wrong model

## **4. cobweb phenomenon**

-agriculture example, when supply exceeds need, supply purchases for next year will be lower

## **5. lags**

-when dependent variable depends on last period's data

\***autoregression**- when one of the explanatory variables is a lag of the dependent variable

## **6. manipulation of data**

-all data massaging techniques

-dividing yearly by 4 to get monthly data

\***interpolation, extrapolation**- ad hoc assumptions; 1995 population from 1990 census

## **7. data transformation**

-level form v. (first) difference form (lagged values)

\***dynamic regression models**- when the regressands are lagged

## **8. nonstationarity**

-stationary time series data is that which does not change over time: mean, variance....

## **OLS estimation with**

-in the presence of autocorrelation the OLS estimators remain unbiased, consistent, and asymptotically normally distributed, they are no longer efficient; so the usual F, t, and  $X^2$  tests cannot be used

-the remedy depends on the nature of the interdependence among the disturbances  $u$ ; but since the disturbances are unobservable, the common practice is to assume that they are generated by some mechanism

-the mechanism that is most commonly assumed is the Markov-first order autoregressive scheme AR(1)

\***white noise error term**- the value of the disturbance term in period  $t$  is equal to  $\rho$  times its value in the previous period plus a purely random error term

\***Markov first –order autoregressive scheme, first-order regressive scheme AR(1)**- is autoregressive because the regression of  $u$  is lagged 1 period; it is first order because  $u$  and its immediate past values are involved, that is, the maximum lag is 1

-AR(1) assumes that the disturbance in the current time period is linearly related to the disturbance term in the previous time period, with the coefficient of autocorrelation  $\rho$  providing the extent of the interdependence

\***first-order coefficient of autocorrelation, the coefficient of autocorrelation at lag 1-coefficient of autocovariance ( $\rho$ )  $\rho$**

-since  $\rho$  is a constant between -1 and 1, under the AR(1) scheme the variance of  $u$  is homoscedastic, but  $u$  is correlated with its immediate past value and several other past values



- $|p| < 1$ ; if  $|p| = 1$ , then the variances and covariances are not defined  
 -if  $|p| < 1$ , then the AR(1) process is stationary (mean, variance, and covariance of  $u$  do not change over time) and it is clear that the value of the covariance will decline as we go into the past

-if the AR(1) scheme is valid and coefficient of determination is known, then the serial correlation problem can be easily attacked by transforming the data following the generalized data procedure; the AR(1) scheme can be easily generalized to an AR( $p$ ); one can also assume a moving average mechanism (MA), or a mixture of AR and MA known as ARMA

### **BLUE estimator in presence of**

-in GLS we incorporate any additional information we have (nature of heteroscedasticity or of autocorrelation) directly into the estimating procedure by transforming variables, whereas in OLS such side information is not directly taken into consideration  
 -if  $\rho = 0$ , there is no additional information to be considered and hence both the GLS and OLS estimators are identical  
 -Gauss-Markov theorem and Krushkal's theorem can lead the OLS to be BLUE

### **Consequences of using OLS with Allowing for autocorrelation**

-will be likely to declare a statistically significant coefficient insignificant even though, with GLS, it may be

### **Disregarding autocorrelation**

-errors will arise for the following reasons:

1. the residual variance is likely to underestimate the true variance
2. as a result, we are likely to overestimate  $R^2$
3. even if the variance is not underestimated, the variance of beta 1 may underestimate beta 2, its variance under first-order correlation
4. therefore, the usual  $t$  and  $F$  tests of significance are no longer valid, and if applied, are likely to give seriously misleading conclusions about the statistical significance of the estimated regression coefficients

### **Detection of**

#### **1. Graphical method**

-subjective or qualitative in nature  
 -producing and analyzing plots of residuals can provide an easy to understand summary of a complex problem; and allow simultaneous examination of the aggregate while clearly displaying the behaviour of individual cases

**A. time sequence plot**- plot the residuals against time

**B. standardized residuals**- plot the standardized residuals against time as well

-residuals/ standard error of the regression

-standardized residuals have 0 mean, approximately unit variance (studentized residuals), and pure numbers (devoid of units of measurement)

#### **2. Runs test (Geary test)**

-nonparametric test- we make no assumptions about the (probability) distribution from which the observations are drawn

-can observe a pattern, or run, of random sequence of observations, to derive a test of randomness of runs

\***run**- an uninterrupted sequence of 1 symbol or attribute, such as + or -

\***length of run**- the number of elements in it

-is there too many (negative autocorrelation) or too few runs (positive autocorrelation)

-if the number of runs does not fall within the confidence interval, the residuals exhibit autocorrelation

-Swed and Eisenhart developed special tables for critical values of runs in a random sequence of  $N$  observations if  $N_1$  or  $N_2$  is less than 20

### **3. Durbin-Watson d test**

-most popular and widely used; hoary past, but has limitations

-is the ratio of the sum of squared differences in successive residuals/ RSS

-in the numerator of the d statistic the number of observations is  $n-1$ , because 1 observation is lost in taking successive differences

-advantage of d statistic is that it is based on estimated residuals, which are routinely estimated in regression analysis

-because of this, it is common practice to report the DW-d stat along with other summary measures such as  $R^2$ , adjusted  $R^2$ , and t and F stats

#### **Assumptions underlying**

1. the regression model includes the intercept term; if that is not present, as in the case of regression through the origin, it is essential to rerun the regression including the intercept term to obtain the RSS

**2. the explanatory variables, the X's, are nonstochastic, or fixed in repeated sampling**

3. the disturbances  $u$ , are generated by the first-order autoregressive scheme; therefore, it cannot be used to detect higher-order auto-regressive schemes

**4. the error term  $u$  is assumed to be normally distributed**

**5. the regression model does not include the lagged values of the dependent variable as 1 of the explanatory variables; thus, the test is inapplicable in models where  $Y_{t-1}$  is the 1 period lagged value of  $Y$  (autoregressive model)**

6. there are no missing observations in the data

-the exact sampling distribution of the d stat is difficult to derive because it depends in a complicated way on the X values present in a given sample

-understandable because d is computed from  $u$ , which are dependent on the X values; therefore, unlike the t, F, or  $X^2$  tests, there is no unique critical value to use for rejection purposes

-however, an upper and lower boundary d value has been created, which allows for a decision on the presence of positive or negative serial correlation

-these limits depend only on the number of observations (200) and the number of explanatory variables (20)

-if  $\rho=0$ , then  $d=2$ ; if there is no serial correlation (of the first order), d is expected to be about 2; therefore, if d is found to be 2 in an application, then one may assume that there is no first-order autocorrelation, either positive or negative

-if  $\rho=+1$ , indicating perfect positive correlation in the residuals,  $d=0$ ; therefore, the closer  $d$  is to 0, the greater the evidence of positive serial correlation; because, if there is positive autocorrelation, the  $u$ 's will be bunched together and their differences will therefore tend to be small; as a result, the numerator sum of squares will be smaller in comparison with the denominator sum of squares, which remains a unique value for any given regression

-if  $\rho=-1$ , that is, there is perfect negative autocorrelation among successive residuals,  $d=4$ ; hence, the closer  $d$  is to 4, the greater the evidence of negative serial correlation; this is understandable, because if there is negative autocorrelation, a positive  $u$  will be followed by a negative  $u$  and vice versa so that  $|u_t - u_{t-1}|$  will usually be greater than  $|u|$ ; therefore, the numerator of  $d$  will be comparatively larger than the denominator

### **Mechanics**

1. run the OLS regression and obtain the residuals
2. compute  $d$ ; computer does it
3. for the given sample size and given number of explanatory variables, find out the critical values for  $d_l$  and  $d_u$
4. follow the decision rules

-if  $d$  is between  $d_u$  and  $4-d_u$ , then there is no autocorrelation

-if  $d$  is between 0 and  $d_l$ , then there is positive autocorrelation

-if  $d$  is between  $4-d_l$  and 4, then there is negative autocorrelation

**\*indecisive zone-** 1 drawback of  $d$  test; if  $d$  falls within this zone, one cannot conclude that (first-order) autocorrelation does or does not exist

-authors have determined that the upper limit  $d_u$  is approximately the true significance limit and therefore in case  $d$  lies in the indecisive zone, one can use the modified  $d$  test

-the indecisive zone narrows as the sample size increases

-SHAZAM gives a good  $d$  value

### **D-test problems**

#### **2. the explanatory variables, the $X$ 's, are nonstochastic, or fixed in repeated sampling**

-most serious problem with  $d$  test

-if this is not the case, the  $d$  test is not valid in finite or large samples

-since this assumption is always hard to maintain in time series data, the Durbin-Watson may not be useful in econometrics involving time series data

-large sample tests, like the Breusch-Godfrey are more useful

#### **4. the error term $u$ is assumed to be normally distributed**

-if this is not the case, the runs (Geary) test is the best; it does not make a probability distributional assumption about the error term; that is, in large samples the  $d$  statistic follows the standard normal distribution; in large samples, the square root of the sample size times the estimated first-order correlation also follows the standard normal distribution

-asymptotically, if the null hypothesis of 0 first-order correlation were true, the probability of obtaining a  $Z$ -value (standardized normal variable) of as much as 5.94 or greater is extremely small; for a 2-tailed standard normal distribution, critical 5%  $Z$  is 1.96, and for 1% critical  $Z$  is 2.58; sample size around 40 should suffice

**5. the regression model does not include the lagged values of the dependent variable as 1 of the explanatory variables; thus, the test is inapplicable in models where  $Y_{t-1}$  is the 1 period lagged value of Y (autoregressive model)**

-if a regression model contained lagged values of the regressand, the d value would be around 2, which suggests there is no first order auto-correlation; thus, there is a built in bias against discovering autocorrelation in such models; Durbin's h test and the Breusch-Godfrey test

Durbin h

-used when the model contains lagged regressands as a regressor (autoregressive models)

4. *Asymptotic normality test*

5. *Berenblutt-Webb test*

6. von Neumann ratio test

-simple equation

**7. Breusch-Godfrey test (Langrange-Multiplier) BG, LM**

-best test to use; more general than Durbin-Watson d and allows for both AR and MA error structures as well as the presence of a lagged regressand as an explanatory variable; large sample test

**Allows for:**

1. nonstochastic regressors, such as the lagged values of the regressand
2. higher-order autoregressive schemes, such as AR(1), AR(2), etc.
3. simple or higher-order moving averages of white noise error terms, such as  $e_t$

**Mechanics**

1. estimate the equation by OLS and obtain the residuals,  $u_t$
2. regress  $u_t$  on the original  $X_t$ , where the latter are the lagged values of the estimated residuals in step 1; thus, if  $p=4$ , then we will introduce 4 lagged values of the residuals as additional regressors in the model; to run the regression, we will only have  $(n-p)$  observations
3. if the sample size is large, (technically infinite), BG have shown that: asymptotically  $(n-p)$  times the  $R^2$  value obtained from the auxiliary regression follows the chi-square distribution with  $p$  df; if in an application,  $(n-p)R^2$  exceeds the critical chi-square value at the chosen level of significance, we reject the null hypothesis, in which case at least 1  $\rho$  is statistically significant different from 0

**Practical Points**

1. the regressors included in the regression model may contain lagged values of the regressand Y, that is  $Y_{t-1}$ ,  $Y_{t-2}$  etc., may appear as explanatory variables; contrast this model with the Durbin-Watson test restriction that there be no lagged values of the regressand among the regressors
2. the BG test is applicable even if the disturbances follow a  $p$ th-order moving average (MA) process; that is the  $u_t$  are generated where  $e_t$  is a white noise error term, that is, the error term that satisfies all the classical assumptions

3. if  $p=1$ , meaning first-order auto-regression, then the BG test is known as Durbin's M test

4. a drawback to the BG test is that the value of  $p$ , the length of the lag, cannot be specified a priori; some experimentation with the  $p$  value is inevitable; one can use the so-called Akaike and Schwartz information criteria to select the lag length

-no test has yet been judged to be unequivocally best (more power in the statistical sense); same with heteroscedasticity

### **Remedial Actions**

-4 options

#### **1. Model misspecification v. pure autocorrelation**

-simply could be due to model misspecification

-can apply Jacque-Bera test of normality to ensure residuals are normally distributed, d test assumes this

#### **2. Correcting for pure autocorrelation: GLS**

##### **A. When $p$ is known**

-can be easily solved

-do some math to get an error term that satisfies the usual OLS assumptions; we can apply OLS to the transformed variables  $Y$  and  $X$  and obtain estimators with all the optimum properties, including BLUE; this is tantamount to running GLS, which is OLS applied to the transformed model that satisfies the classical assumptions

**\*generalized, quasi difference equation-** regress  $Y$  on  $X$ , not in the original form, but in the **difference form**, which is obtained by subtracting a proportion ( $=p$ ) of the value of a variable in the previous time period from its value in the current time period; in this differencing procedure we lose 1 observation because the first observation has no antecedent

**\*Prais-Winsten transformation-** used to avoid the loss of the initial observation; transforms the first observation on  $Y$  and  $X$

##### **B. When $p$ is not known**

-even if we use an AR(1) scheme, the coefficient of autocorrelation is not known a priori; methods of estimating  $p$  include:

#### **1. The first-difference method**

-since  $p$  lies between 0 and  $\pm 1$ , one can start from 2 extreme positions:  $p=0$  (no first-order serial correlation) and  $p=\pm 1$  (perfect positive or negative correlation)

**\*first difference equation-** when  $p=\pm 1$ , the generalized difference equation reduces to the first difference equation

-since the error term is free from (first-order) serial correlation, one just has to form the first differences of both the regressors and regressand and run the regression on these first differences

-the first difference transformation may be appropriate if the coefficient of autocorrelation is high (excess of .8), or if the Durbin-Watson  $d$  stat is quite low

**\*Maddala's rule of thumb-** use the first difference form whenever  $d < R^2$

#### **Aspects of first difference model**

**A.** there is no intercept through it; you need to use the regression through the origin

-if you forget to drop the intercept term, the original model must have a trend in it and  $B_1$  represents the coefficient of the trend variable; therefore, one “accidental” benefit of introducing the intercept term in the first-difference model is to test for the presence of a trend variable in the original model

**B.** stationary properties of the underlying time series; if  $p=1$ , then it is clear that the series  $u_t$  is nonstationary, for the variances and covariances become infinite

-if the autocorrelation is in fact 1, that is, it is the first differenced  $u_t$  that becomes stationary, for it is equal to  $\epsilon_t$ , which is a white noise error term

-if the original time series are nonstationary, very often their first differences become nonstationary; therefore, first-difference transformation serves a dual purpose in that it might get rid of (first-order) autocorrelation and also render the time series stationary

-the first-difference transformation may be appropriate if  $p$  is high or  $d$  is low; strictly speaking, the first-difference transformation is valid only if  $p=1$

\***Berenblutt-Webb test**- tests hypothesis that  $p=1$ ; use the  $g$  statistic

-to test the significance of the  $g$  statistic, assuming that the level form regression contains the intercept term, we can use the Durbin-Watson tables except that now the null hypothesis is that  $p=1$  rather than the Durbin-Watson hypothesis that  $p=0$

## 2. $p$ based on Durbin-Watson $d$ statistic

-used when we cannot use the first-difference transformation because  $p$  is not sufficiently close to unity;  $p$  can be estimated based on the relationship between  $d$  and  $p$

-thus, in reasonably large samples one can obtain  $\rho$  and use it to transform the data as shown in the generalized difference equation

### Theil-Nagar modified $d$

-used for small samples when the relationship between  $p$  and  $d$  doesn't hold

-simple equation

## 3. $p$ estimated from the residuals

-if the AR(1) scheme is valid, a simple way to estimate  $\rho$  is to regress the residuals  $u_t$  on  $u_{t-1}$ , for the  $u_t$  are consistent estimators of the true  $u_t$

-there is no need to introduce the intercept term, for we know the OLS residuals sum to 0

-since the  $\rho$  estimated by this procedure is about the same as that obtained from the Durbin-Watson  $d$ , the regression results using the  $\rho$  should not be very different from those obtained from the  $\rho$  estimated from the Durbin-Watson  $d$

## 4. Iterative methods

-successive approximations, starting with some initial value of  $p$

### A. Cochrane-Orcutt (C-O) iterative procedure

-most popular

-can be used for AR(1) and for higher orders

-stop carrying out when successive estimates of  $d$  differ by a small amount, such as .01 or .0005

### B. C-O 2-step method

-shortened version of C-O iterative procedure; gives similar results

### C. Durbin-Watson 2-step process

-just shorter

#### **D. Hildreth-Lu scanning or search procedure**

-since we know  $\rho$  is between -1 and +1, scan different values, such as by .01

#### **Comments**

1. in large samples these methods yield generally similar estimates of  $\rho$ , but in small samples they perform differently
2. any of these methods can be used with the generalized difference method to estimate the parameters of the transformed model by OLS, which is essentially GLS; however, since we estimate  $\rho$ , the estimation method is called feasible, or estimated GLS, or EGLS or FGLS
3. when using EGLS, one has to be careful in dropping the first observation in small samples; can be drastic; in small samples, the first observation must be transformed according to the Prais-Winsten procedure; in large samples excluding the first observation does not matter
4. EGLS has the usual optimum statistical properties only in large samples; in small samples OLS may do better than EGLS, especially if  $\rho < 0.3$

#### **3. Newey-West method of correcting the OLS standard errors**

-instead of using EGLS, we can still use OLS but correct the standard errors for autocorrelation by the Newey-West HAC procedure; valid in large samples

-HAC also corrects for heteroscedasticity as well as autocorrelation

**\*HAC, heteroscedasticity and autocorrelation consistent, Newey-West standard errors**- corrected standard errors

-when you have autocorrelation and heteroscedasticity, use the HAC method, White method is only for heteroscedasticity

-HAC standard errors are much greater than the OLS standard errors and therefore the HAC t ratios are much smaller than the OLS t ratios

#### **4. OLS v. FGLS and HAC**

-OLS is not efficient, but FGLS and HAC do not work well for small samples

-use OLS in small samples when the coefficient of autocorrelation is less than .4

-15-20 observations is small; more than 50 is large

#### **Forecasting with autocorrelation**

**\*static forecasting**- normal

**\*dynamic forecasting**- takes into account the errors made in the past forecasts

-closer to the actual values and the standard errors are smaller than the static forecast

-so it may be profitable to incorporate the AR(1) scheme, or higher order, for the purpose of forecasting; forecasting in to the distant future may be hazardous

#### **Dummy variables**

-how are they transformed?

#### **Mechanics**

1. values of D are 0 for 1 period; for period 2 the value of D for the first observation is  $1/(1-\rho)$  instead of 1, and 1 for the rest

2. variable  $X_t$  is transformed as  $(X_t - pX_{t-1})$ ; we lose the first observation unless Prais-Winsten is used

3. the value of  $D_t X_t$  is 0 for all observations in the first period; in the second period the first observation takes the value of  $D_t X_t = X_t \dots \dots$

-the critical observation is the first observation in the second period

-autocorrelation can be between current and past error variances as well with current and past error terms

**\*autoregressive conditional heteroscedasticity ARCH-** if the error variance is related to the squared error term

**\*generalized autoregressive conditional heteroscedasticity GARCH-** if the error variance is related to squared error terms several periods in the past

-a change in the log of a variable is a relative change, or % change when multiplied by 100

**\*power of statistical test-** 1 minus the probability of committing a Type II error; maximum power of a test is 1, and the minimum is 0; closer the power of test is to 0, the worse the test is; the closer it is to 1, the more powerful and better the test is

### **Heteroscedasticity**

£4- there is an equal variance, homoscedasticity, of the error terms

-cross-sectional data are commonly plagued by heteroscedasticity

### **Nature of**

#### **Why u variance may be variable**

1. error-learning models; as people learn, their errors of behaviour become smaller over time; variances decreases with learning

2. discretionary income increases as income grows; people have more scope for disposition of income; variance increases with profit

3. improvement of data collection techniques; decreases variance

4. outliers- increase variance

5. violation of £9, model specification- exclusion of variables can increase variance

6. skewness in the distribution of 1 or more regressors- increases variance

7. incorrect data transformation (ratio of first difference transformations)

8. incorrect functional form (linear v. log-linear models)

### **OLS estimation with**

-will still be the unbiased estimator even with heteroscedasticity, but will not be BLUE

### **GLS estimation with**

**\*generalized, weighted least squares GLS, WLS-** OLS on the transformed variables that satisfy the standard least-squares assumptions; GLS, WLS estimators



- assigns correct weights or importance to each observation, not equal like OLS; therefore can produce BLUE estimators
- in GLS we minimize a weighted sum of residual squares;

### **Consequences of using OLS with**

- allowing for- skews the confidence intervals, so what appears to be a statistically insignificant coefficient may in fact be significant if the correct confidence intervals were established on the basis of the GLS procedure
- disregarding- if we persist in using the usual testing procedures despite heteroscedasticity, whatever conclusions we draw or inferences we make may be very misleading
- in the presence of heteroscedasticity, you must use GLS; usually only when it is severe because not always easy to apply GLS

### **Detection of**

- in many cases involving econometrics, detection is a matter of intuition, educated guesswork, prior empirical experience, or sheer speculation; we have little control over our research, unlike marine and biology

**1. nature of the problem-** this may indicate whether an issue exists

**2. graphical method-** graph the residuals to see any suspicious activity

**3. Park test**

- formalizes the graphical method

**4. Glejser test**

- similar to Park

**5. Spearman's rank correlation test**

- if computed t exceeds critical t, we can assume heteroscedasticity

**6. Goldfeld-Quandt test**

- depends on the value of c (number of central observations to be omitted) and choosing the correct X

**7. Breusch-Pagan-Godfrey test**

- fills shortcomings of Goldfeld-Quandt

**8. White's general heteroscedasticity test**

- can be a test of pure heteroscedasticity or specification error or both; best test
- if cross-product terms are present, it tests both; if not, just heteroscedasticity

**9. Koenker-Bassett KB test**

- many other tests as well for specific certain assumptions

### **Remedial actions**

**1. when  $\sigma^2$  is known**

- use WLS or GLS; rarely the case

**2. when  $\sigma^2$  is unknown**

- White's heteroscedasticity-consistent variances and standard errors
- this estimate can be performed so that asymptotically valid statistical inferences can be made about the true parameter values
- White's heteroscedasticity-consistent standard errors are known as robust standard errors, or heteroscedasticity-consistent covariance matrix estimators

**Assumptions about heteroscedasticity**

-these are all ad hoc; the situation will determine which ones will work

1. the error variance is proportional to  $X^2$
2. the error variance is proportional to  $X$
3. the error variance is proportional to the square of the mean value of  $Y$
4. a log transformation reduces heteroscedasticity

-reduces a 10 fold difference to 2 fold

-allows the slope coefficient to measure the elasticity of  $Y$  with respect to  $X$

**Problems with transformations**

1. for multi-variable models, we may not know a priori which of the  $X$  variables should be chosen for transforming the data
2. log transformation is not applicable if some of the  $Y$  and  $X$  values are negative or 0
3. spurious correlation- correlation between ratios even though no correlation between variables
4. when  $\sigma^2$  is unknown, the t test and F tests are useful for large samples only

**Caution**

-the impact of nonconstant error variance on the efficiency of OLS estimator depends on several factors: sample size, degree of variation in the  $\sigma^2$ , configuration of the  $X$  (regressor) values, and the relationship between the error variance and the  $X$ 's  
 -worry about it when the largest error variance is more than about 10 times the smallest

**Econometric Modelling: Model Specification and Diagnostic Testing**

£9 model specification- the regression model in the analysis is correctly specified; if not we get a model specification error or bias

-we have model specification errors and equation specification errors

**1. Model Selection Criteria**

1. be data admissible  
 -predictions from model must be logically possible
2. be consistent with theory  
 -make good economic sense
3. have weakly exogenous regressors  
 -the regressors must be uncorrelated with the error term
4. exhibit parameter constancy  
 -the values of the parameters should be constant
5. exhibit data coherency  
 -the residuals estimated from the model must be purely random (white noise)
6. be encompassing  
 -should include all the rival models in a sense that it is capable of explaining their results

**2. Equation/Model Specification Errors- more equation, model is a result of**

1. omission of a relevant variable

2. inclusion of an unnecessary variable
3. adopting the wrong functional form
4. errors of measurement in the regressand and regressors
5. incorrect specification of the stochastic term (model mis-specification error)

### Consequences of

#### **1. underfitting a model – omitting a relevant variable**

- a. the OLS estimators of the variables retained in the model are not only biased but are inconsistent as well
  - b. the variance and standard errors of these coefficients are incorrectly estimated
  - c. therefore vitiating the usual hypothesis testing procedures
  - d. forecasts are now unreliable
- once a model is formulated on the basis of relevant theory, one is ill-advised to drop a variable from such a model

#### **2. overfitting a model- including a superfluous variable**

including irrelevant variables is less serious;

- a. the estimators of the coefficients of the relevant as well as irrelevant variables remain unbiased as well as consistent
- b. the error variance,  $\sigma^2$ , remains correctly estimated
- c. usual hypothesis testing and confidence interval procedures remain valid
- d. the only problem is that the estimated variances tend to be larger than necessary, thereby making for less precise estimation of the parameters; that is, the confidence intervals tend to be larger than necessary

-asymmetry between the 2: better to include irrelevant variables than omit the relevant ones

-best approach is to include only the explanatory variables that, on theoretical grounds, directly influence the dependent variable and that are not accounted for by other included variables

### Tests of

-either because the theory is weak or we have bad data

-because of the non-experimental nature of economics, we are never sure how the observed data were generated; the test of any hypothesis in economics always turns out to depend on additional assumptions necessary to specify a reasonably parsimonious model, which may or may not be justified

-essentially tests of nested hypotheses

#### **A. Detecting the presence of unnecessary variables**

\***maintained hypothesis**- the truth, or the original model

-just see which variables are significant or not with F and t tests

-do not build model iteratively though (bottom-up approach, or data mining)

\***data mining regression fishing, data grubbing, data snooping, number crunching** - develop the best model after several diagnostic tests so that the model chosen is finally a good model in the sense that all the coefficients have the right signs, they are statistically

significant on the basis of the F and t tests, high  $R^2$ , and Durbin-Watson has acceptable d value, around 2 etc.

-in data mining (pretesting), traditional levels of significance are not the true levels of significance; taking 5 out of 15 regressors at 5% is actually 15% significance

-if  $c=k$  then there is no data mining and the true and nominal levels of significance are the same

-allow for data mining theory while avoiding the considerable dangers in data mining

## **B. Tests for omitted variables and incorrect functional form**

-to detect equation specification errors

-if diagnostic measures are good, the model is good

### **1. Examination of residuals**

-good visual diagnostic for to detect heteroscedasticity or autocorrelation

-these residuals can also be examined, especially in cross-sectional data, for model specification errors, such as omission of an important variable or incorrect functional form

-if there are specification errors, the residuals will exhibit noticeable patterns

### **2. Durbin-Watson d stat**

-if the d test signifies correlation among the residuals, then what it means is that some variables that belong in the model are included in the error term and need to be culled out from it and introduced in their own right as explanatory variables

-just casually add in the excluded variable and check with the Durbin tables

### **3. Ramsey's RESET test**

-regression specification error test

-adds the regressand into the regressor side

-does not tell what the better model is, just says if it is mis-specified

### **4. Lagrange Multiplier test for adding variables**

-alternative to Ramsey's

-linear cost function is a restricted version of the cubic cost function

\*(**restricted least squares, linear cost function**)- assumes that coefficients of the squared and cubed output terms are equal to 0

-estimate the restricted regression by OLS and obtain the residuals; if in fact the restricted regression is correct, then the residuals obtained should be related to the squared and cubed outputs:  $X^2$   $X^3$

## **Errors of measurement**

-special types of specification error is errors of measurement in the value of the regressand and regressors; if the errors are in the regressand only, the OLS estimators are unbiased and consistent, but are less efficient; if the errors are in the regressors, the OLS estimators are biased as well as inconsistent

-even if errors of measurement are detected or suspected, the remedies are not easy; use of instrumental or proxy variables is theoretically attractive, but not always practical; thus it is very important to state the sources of data, how they were collected, what definitions were used; data collected by official agencies comes with several footnotes and the researcher should note those

## **Incorrect specification of the stochastic error term**

-since the error term  $u$  is not directly observable, there is no way to determine the form in which it enters the model

### **Nested v. non-nested models**

-for testing nested and non-nested hypotheses

-for comparing models or hypotheses for best fit

-model mis-specification errors can be as serious as equation specification errors

Non-nested, encompassing- common in economics, such as monetarist v. Keynesian

-B is nested in A when it is a special case of A

### **Nested hypotheses tests- more usual, typical hypotheses we use**

1. F tests

2. t test

### **Non-nested hypotheses tests**

2 approaches: discrimination and discerning

**A. discrimination approach-** where given 2 or more competing models, one chooses a model based on some criteria of goodness of fit

-the regressand must be the same

1. Akaike's information criterion AIC

2. Schwarz's information criterion SIC

3. Mallows's  $C_p$  criterion

4.  $R^2$

5. adjusted  $R^2$

**B. discerning approach-** where, in investigating 1 model, we take into account information provided by other models

### **1. F test, non-nested or encompassing**

-not going to be used too often

-problems: multicollinearity, wrong model choice can result

### **2. Davidson-MacKinnon J test**

**\*encompassing principle-** adds the regressand from model C to model D

-could reject or accept both

-if both models are accepted, the data is not rich enough to discriminate between the 2 hypotheses (models)

3. Cox test

4. JA test

5. P test

6. Mizon-Richard encompassing test

### **Model Selection Criteria**

-these criteria are not absolute but are adjunct to a careful specification analysis

-all except  $R^2$  impose a penalty for adding more regressors; trade off between goodness of fit and complexity (£ of regressors)

**\*in-sample forecasting-** tells us how the chosen model fits the data in a given sample

**\*out-of-sample forecasting-** concerned with determining how a fitted model forecasts future values of the regressand, given the values of the regressors

### **1. Akaike's information criterion AIC**

- uses log transformations
- imposes harsher penalty than adjusted  $R^2$  for adding more variables
- lower the AIC, the better fit
- useful for both nested and non-nested models
- can be used to determine lag length in AR(p) model

## 2. Schwarz's information criterion SIC

- imposes harsher penalty than AIC
- like AIC, the lower the value the better
- like AIC, can be used to compare in-sample or out-of-sample forecasting performance of a model

## 3. Mallows's Cp criterion

- uses the Cp criterion to evaluate model fit
- look for a model with a low Cp value that is equal to p

## 4. $R^2$

- closer to 1, the better the fit

### Problems with

1. measures in-sample goodness of fit, how close an estimated Y is to its actual value in a given sample; no guarantee it will forecast well out-of-sample observations
2. in comparing 2 or more  $R^2$ 's, the regressand must be the same
3. always increases when more variables are added, which also increases variance of forecast error

## 5. adjusted $R^2$

- designed as a penalty for adding regressors just to increase  $R^2$
- unlike  $R^2$ , the adjusted will increase only if the absolute t value of the added variable is greater than 1; there the adjusted is a better measure for comparison

### Forecast $X^2$

- used to see how the estimated model forecasts data not included in the sample, post sample period
- has weak statistical power, meaning should be used as an indicator only and not definitive test

### Outliers, Leverage, and Influence

- in minimizing the residual sum of squares (RSS), OLS gives equal weight to every observation in the sample; but every observation may not have equal impact on the sample because of these 3 types of points
- the residual,  $u$ , represents the difference (positive or negative) between the actual value of the regressand and its value estimated from the regression model
- \***outlier**- an observation with a large residual
- \***leverage**- can be high or low; if the observation is disproportionately distant from the bulk of the values of a regressor
- matters because it is capable of pulling the regression line towards itself, thus distorting the slope of the regression line
- \***influential points**- when the outlier exhibits significant leverage
- automatic rejection of outliers is not always a wise procedure; sometimes the outlier is providing useful information that other data points cannot due to the fact that it arises from an unusual combination of circumstances which may be of vital interest and

requires further investigation rather than rejection; as a general rule, outliers should be rejected out of hand only if they can be traced to causes such as errors of recording the observations or setting up the apparatus (in a physical experiment)

### **Recursive least squares**

-used when we do not know the point of the structural break in a data set; Chow's test can be used when we know the break

-typically used in time series, but can also be a good diagnostic tool in cross-sectional data where the data are ordered by some size or scale variable, such as the employment or asset size of the firm

### **Chow's prediction failure test**

-his structural test can be modified to test the predictive power of a regression model

### **10 commandments**

1. use common sense and economic theory
2. ask the right questions (put relevance before mathematical elegance)
3. know the context (do not perform ignorant statistical analysis)
4. inspect the data
5. do not worship complexity (KISS- keep it stochastically simple)
6. look long and hard at the results
7. beware the costs of data mining
8. be willing to compromise (do not worship textbook prescriptions)
9. do not confuse significance with substance (do not confuse statistical significance with practical significance)
10. confess in the presence of sensitivity (anticipate criticism)

### **Nonlinear-in-the-Parameter Regression Models**

-intrinsically nonlinear in the parameters

-if we drop the assumption of normality, it is possible to obtain nonlinear and/or biased estimators that may perform better than the OLS estimators

### **Intrinsically Linear and intrinsically nonlinear regression models**

-models that are linear in the parameters as well as the variables is a linear regression model and so is a model that is linear in the parameters but not in the variables

-models that are nonlinear in the parameters are nonlinear regression model whether the variables are linear or not (NLRM)

-some models that appear nonlinear in the parameters are inherently or intrinsically linear because with suitable transformation they can be made linear-in-the-parameters

### **Estimation of linear and nonlinear regression models**

-the mathematics underlying linear regression models is comparatively simple in that one can obtain explicit, or analytical, solutions of the coefficients of such models; the small-sample and large-sample theory of inference of such models is well established

-in contrast, for intrinsically nonlinear regression models, parameter values cannot be obtained explicitly; they have to be estimated numerically, that is by iterative procedures  
**\*exponential regression model**- often used to measure the growth of a variable, such as GDP or population

$$Y_i = \beta_1 e^{\beta_2 X_i} + u_i$$

-unlike normal equations for linear regression models, nonlinear regression models have the unknown's ( $\beta$ 's) both on the left and right hand side

-thus, we cannot obtain explicit solutions of the unknowns in terms of the known quantities; the unknowns are expressed in terms of themselves and the data; therefore, although we can apply OLS to estimate the parameters of the nonlinear regression models, we cannot obtain explicit solutions of the unknowns

-OLS applied to a nonlinear regression model is nonlinear least squares NNLS

### Approaches to estimating nonlinear regression models

#### 1. Direct search, trial and error method, derivative-free method

-obtain estimates through prior research, experience, or a pseudo regression line

-very iterative and time consuming procedure

-must continually insert values until the RSS is low as possible

-generally not used; if several parameters are involved, becomes impossible

-may find just a local minimum, not an absolute or global

#### 2. Direct optimization, NLLS

-differentiate the error sum of squares with respect to each unknown coefficient or parameters et the resulting equation equal to 0, and solve the resulting normal equations simultaneously; still needs an iterative procedure

**\*method of steepest descent**- similar to trial and error, but selects the values more systematically; very slow though

#### 3. Iterative linearization method (through Taylor Series expansion)

-linearize a nonlinear equation around some initial values of the parameters; the linearized equation is then estimated by OLS and the initially chosen values are adjusted; these adjusted values are used to relinearize the model, and then estimated again by OLS again and again

-Taylor series method from calculus is the main technique in linearizing a nonlinear equation

1. Gauss-Newton

2. Newton-Raphson

3. Marquard

-compromise between the method of steepest descent and the linearization (Taylor series method)

-NLLS estimators do not possess optimal properties in finite samples, but in large samples they do have such properties; therefore, the results of NLLS in small samples must be interpreted carefully



-autocorrelation, heteroscedasticity, and model specification problems can plague NLRM as well

### Qualitative Response regression models

-refer to models where the regressand is qualitative in nature (not quantitative or an interval scale)

### Nature of Qualitative Response Models

-simplest possible qualitative response regression model is the binary model in which the

**\*binary, dichotomous variable-** can be either yes or no; 1 or 0

-could also be trichotomous or polychotomous

-usually referred to as probability models

-models can also incorporate ordinal and nominal data

**\*count data, rare event data-** Poisson probability process; number of doctor visits in a year

### A. Linear Probability Model LPM

-simplest binary regression model; the binary response variable is regressed on the relevant explanatory variables using standard OLS methodology

-suffers from several estimation problems however

-even if these problems are overcome, the fundamental weakness is still that it assumes that the probability of something happening increases linearly with the level of the regressor; this very restrictive assumption can be avoided if we use the logit or probit models

$$Y_i = \beta_1 + \beta_2 X_i + u_i$$

-where the conditional expectation of  $Y_i$  given  $X_i$ ,  $(E(Y_i|X_i))$  is the conditional probability that the event will occur given  $X_i$ ; that is:  $\Pr(Y_i=1|X_i)$

**\*Bernoulli distribution-** can be explained by the Bernoulli probability distribution, where the expectation of a Bernoulli random variable is the probability that the random variable equals 1

**\*binomial distribution-** if there are  $n$  independent trials, each with a probability  $p$  of success and probability of failure  $(1-p)$ , and  $X$  of these represent the number of successes, then  $X$  is said to follow the binomial distribution

-since the probability of  $p$  must lie with between 0 and 1, we have the restriction:

$0 < E(Y_i|X_i) < 1$  ;that is, the conditional expectation (or conditional probability) must lie between 0 and 1

### **Issues with LPM**

#### **1. non-normality of the disturbances, $u_i$**

-OLS does not require disturbances to be normally distributed we assume so for the purpose of statistical inference

-but, the assumption of normality is not tenable for LPM, because they take the Bernoulli distribution of only 2 values like the  $Y_i$

-but this may not be so critical, because as the sample size increases indefinitely, OLS estimators tend to be normally distributed; also, OLS point estimates always remain unbiased

## **2. heteroscedastic variances of the disturbances**

-for Bernoulli distributions, the theoretical mean and variance are  $p$  and  $p(1-p)$ , where  $p$  is the probability of success (something happening), showing that the variance is a function of the mean; thus, the error variance is heteroscedastic

-so in the presence of heteroscedasticity, the OLS estimators, although unbiased, are not efficient, they do not have minimum variance

-but this can also be fixed by using WLS

## **3. nonfulfillment of $0 < E(Y_i|X_i) < 1$**

-the main problem with OLS estimation of LPM

-there is no guarantee that  $Y_i$  will lie between 0 and 1

## **2 fixes**

1. use OLS, and if negative assign a value of 0, and if greater than 1 assign a value of 1

2. use logit or probit models

## **4. questionable value of $R^2$ as a measure of goodness of fit**

-conventionally computed  $R^2$  is of limited value in dichotomous response models

-all the  $Y$  values will lie along the  $X$  axis or on the line corresponding to 1; so, the PM will not fit the scatter well; no values will lie outside of 1, so the  $R^2$  will commonly only be around .2-.6, and will be greater than .8 only when the values are clustered around points A and B

-the use of the coefficient of determination should be avoided when using qualitative response models

-currently, at both ends of the distribution, a small change in  $X_i$  will have little effect on the probability of  $Y$

## **2 necessary features needed from the correct binary model**

1. as  $X_i$  increases,  $P_i = E(Y=1|X)$  increases but never stops outside the 0-1 interval

2. the relationship between  $P_i$  and  $X_i$  is nonlinear; "one which approaches 0 at slower and slower rates as  $X_i$  gets small, and approaches 1 at slower and slower rates as  $X_i$  gets very large."

-what we want is a model with a cumulative distribution function CDF (sigmoid, or S shaped curve)

## **B. Logistic (logit) Model**

-used extensively for analyzing growth phenomena

-in the logit model the dependent variable is the log of odds ratio, which is a linear function of the regressors;

**\*(cumulative) logistic probability distribution function-** the probability function that underlies the logit model

$$P_i = E(Y=1|X_i) = 1 / (1 + e^{-(\beta_1 + \beta_2 X_i)})$$

$$\text{-or: } P_i = 1 / (1 + e^{-Z_i}) = e^{Z_i} / (1 + e^{Z_i})$$

-it is easy to verify that as  $Z_i$  ranges from  $-\infty$  to  $+\infty$ ,  $P_i$  ranges between 0 and 1 and that  $P_i$  is nonlinearly related to  $Z_i(X_i)$ , thus satisfying the 2 requirements

-but now  $P_i$  is nonlinear not only in  $X$  but also in the  $\beta$ 's, which is seen in the above equation; therefore OLS cannot be used, but the above equation can still be linearized as follows:

-if  $P_i$ , the probability of success is equal to the above equation, then  $(1-P_i)$ , the probability of failure is:

$$1-P_i = 1/(1 + e^{Z_i})$$

,therefore,

$$P_i/(1-P_i) = 1+e^{-Z_i}/1+e^{-Z_i}$$

,now,  $P_i/(1-P_i)$  is the odds ratio:  $P_i = .8 = 4$  to  $1$

-taking the natural log we get:

$$L_i = \ln(P_i/(1-P_i)) = Z_i = \beta_1 + \beta_2 X_i$$

-where  $L$ , the log of the odds ratio, is not only linear in  $X$  but also in the parameters

- $L$  is called the logit, thus the logit model

### **Logit Model Features**

1. As  $P$  goes from 0 to 1 ( as  $Z$  varies ranges from  $-\infty$  to  $+\infty$ ), the logit ( $L$ ) ranges from  $-\infty$  to  $+\infty$ ; so although the probabilities lie between 0 and 1, the logit is not so bounded
2. Although  $L$  is linear in  $X$ , the probabilities themselves are not; this property is in contrast with the LPM model where the probabilities increase linearly with  $X$
3. as many regressors as liked can be added
4. the logit becomes negative and increasingly large in magnitude as the odds ratio decreases from 1 to 0 and becomes increasingly large and positive as the odds ratio increases from 1 to infinity
5.  $\beta_2$ , the slope, measures the change in  $L$  for a unit change in  $X$ ; the intercept,  $\beta_1$ , is the value of the log-odds in favour of the '1' value; may not have any meaning
6. we can estimate the probability of  $X$  given  $\beta_1 + \beta_2$
7. whereas the LPM assumes that  $P_i$  is linearly related to  $X_i$ , the logit model assumes that the log of the odds ratio is linearly related to  $X_i$

### **Estimation of the logit model**

-to estimate the logit model, we need the value of the regressand,  $Y$ , and the  $X$  values; the values of  $Y$  depends on whether we have micro or macro data

#### **1. Individual level**

if data are available at the individual, or micro level, then nonlinear-in-the-parameter estimating procedures are called for

-have to use **maximum likelihood ML** to estimate the parameters

-one should not overplay the importance of goodness of fit when the regressand is dichotomous

#### **General Observations**

1. the estimated standard errors are asymptotic, since this is a ML large sample method
2. we use the standard normal  $Z$  distribution instead of the  $t$ ; the  $t$  still converges to the normal distribution when the sample size is large
3. conventional  $R^2$  goodness of fit measures do not work in binary regression models; this is of secondary importance in binary regression models though, the important thing is the signs of the coefficients and their statistical and/or practical significance; still use a pseudo  $R^2$

4. to test the null that all slope coefficients are simultaneously equal to 0, use the **likelihood ratio statistic LR**

-whichever is classified as 1, means negative values increase its likelihood

-whichever is classified as 0, positive values increase

-it doesn't matter which way it is done

## **2. Grouped or replicated data (glogit)**

-uses repeat observations

-if the data are available in grouped form, we can use OLS to estimate the parameters of the logit model, provided we take into account explicitly the heteroscedastic nature of the error term

-can use WLS, or OLS by transformation, for grouped data; valid for large samples

-gives odds interpretations or probabilities

**\*logistic growth model-** used extensively in analyzing growth phenomena, such as population, GNP, and money supply.

## **C. Normal (probit, normit) Model**

-if we choose the normal distribution as the appropriate probability distribution, we can use the probit model

-this model is mathematically more challenging, as it involves integrals

-depends on utility theory or rational choice perspective

-still uses a CDF

-decision for the dichotomous variable depends on a **utility index, or latent variable** the **critical or threshold level** for this utility index determines which value of the regressand will be chosen, thus the normal distribution

-the method of obtaining the index as well as the  $\beta$ 's depends on whether the data is grouped or individual, just like the logit

$$I_i = \beta_1 + \beta_2 X_i$$

### **1. Individual level**

-use ML like the logit model

-results will be qualitatively similar

### **2. Group level (gprobit)**

-the unobservable utility index is known as the **normit, or normal equivalent deviate**, just like the logit

-since the NED, or  $I_i$ , will be negative whenever  $P_i < .5$ , in practice the number 5 is added to the NED and the result is called a probit

## **Model Comparisons**

**LRM-** slope coefficient measures the change in the average value of the regressand for a unit change in the value of a regressor

**LPM-** slope coefficient measures directly the change in the probability of an event occurring as the result of a unit change in the value of a regressor

**Logit-** slope coefficient of a variable gives the change in the log of the odds associated with a unit change in that variable

Probit- rate of change of the probability is difficult to flesh out

- difference is that in both the logit and probit models, all the regressors are involved in computing the changes in probability, whereas in the LPM only the jth regressor is involved
- logit has slightly fatter tails than probit; the conditional probability  $P_i$  approaches 0 or 1 at a slower rate in logit than in probit
- logit and probit give similar results
- =however, although the standard logistic (basis of logit) and the standard normal distributions (basis of probit) both have a mean value of 0, their variances are different; 1 for the standard normal distribution and  $\pi^2/3$  for the logistic distribution, where  $\pi = 22/7$ ; and so if you multiply the probit coefficient by about 1.81 ( $\pi/\sqrt{3}$ ), the coefficients are equal; conversely, multiply a logit coefficient by .55 ( $1/1.81$ ) you get equal results; other approximations include .625 and 1.61

### Tobit Model

- closely related to the probit model; also known as censored regression model
- in this model, the response variable is observed only if certain conditions are met; thus the question of how much one spends on a car is meaningful only if one decides to buy a car

$$Y_i = \beta_1 + \beta_2 X_i + u_i \quad \text{if RHS} > 0 \\ = 0 \quad \text{otherwise, where RHS = right hand side}$$

- however, the tobit model is appropriate only in those cases where the latent variable (the basic variable underlying a phenomenon) can in principle, take negative values and the observed 0 values are a consequence of censoring and nonobservability
- uses 2 samples: 1 with information on regressors and regressand and 1 with information just on the regressors (**censored sample**)
- because of this, also known as **limited dependent variable regression models**
- \*\*opposes to a **truncated sample**, where information is available only if the regressand is observed
- uses ML to estimate the censored regression model
- alternative to ML is the **inverse Mills ratio or the hazard rate**, although not as accurate as ML

### Poisson Model

- used when the response variable is of the count type
- based on the Poisson probability distribution
- underlying variable in each case is discrete; it takes only a finite number of values
- can also refer to rare or infrequent occurrences, such as lottery winnings
- just as the Bernoulli distribution was used for binary responses, the Poisson is used for count data
- in the Poisson distribution, its variance is the same as its mean value

$$Y_i = E(Y_i) + u_i = \mu_i + u_i$$

$$Y_i = \mu^Y e^{-\mu} / Y! + u_i$$

**Ordered logit and probit**

- when the regressand is ordinal in nature
- such as yes, no, maybe

**Multinomial logit and probit**

- can be ordered or non-ordered: Liao

**\*duration models**- where the duration of a phenomenon, such as unemployment or sickness, depends on several factors: the length or spell of the duration is of interest  
 -mathematics involves the CDFs and PDFs

**-survival analysis or time-to-event data analysis****Panel data regression models**

- combine time series and cross-sectional observations

**\*pooled data, combination of time series and cross-section data, micropanel data-**

pooling of time series and cross-sectional observations

**\*longitudinal data**- study over a time of a variable or group of subjects

**\*event history analysis**- studying the movement over time of subjects through successive states or conditions

**\*cohort analysis**- following the career path of 1965 graduates of a business school

- panel data is all of these; panel data regression models

**Panel Data Sets**

1. Panel Study of Income Dynamics PSID- UM, collects data on 500 families about various socioeconomic and demographic variables
  2. Survey of Income and Program Participation SIPP
- many others

**Advantages of panel data**

1. takes heterogeneity into account by allowing for individual specific variables; since panel data relates to individuals, firms, states, countries (microunits), bound to be heterogeneity
2. increase sample size, more variability, less collinearity among variables, more degrees of freedom, and more efficiency
3. better suited to study the dynamics of change, by studying the repeated cross-section of observations; spells of unemployment, job turnover, labour mobility
4. can better detect and measure effects that cross-sectional and time series data isn't able to
5. enables us to study more complicated behavioural models; economies of scale and technological change
6. minimize the bias that might result if we aggregate individuals or firms into broad aggregates by making data available for several thousand units

**\*balanced panel**- each cross-sectional unit has the same number of time series observations

**\*unbalanced panel**- number of observations differs among panel members

### Estimation and Inference problems

1. same issues that plague cross-sectional (heteroscedasticity) and time series (autocorrelation)
2. cross-correlation in individual units at the same point in time

### Estimation of Panel data models

#### **1. Fixed Effects approach FEM**

5 possibilities

##### **1. all coefficients constant across time and individuals**

-simplest approach and involves using OLS for a **pooled regression**

##### **2. slope coefficients constant but the intercept varies across individuals LSDV**

-fixed effect assumes that the individual coefficients may differ across individuals, but not across time (time invariant)

-to take into account the different intercepts across companies, one can use dummy variables

**\*least squares dummy variable LSDV, covariance model**- FEM model using dummy variables

-the intercept in the regression model is allowed to differ among individuals in recognition of the fact that each individual, or cross-sectional, unit may have some special characteristics of its own

-FEM is appropriate in situations where the individual-specific intercept may be correlated with 1 or more regressors

-we can allow for time effect by introducing time dummies

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + u_{it}$$

$$Y_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \beta_2 X_{2it} + \beta_3 X_{3it} + u_{it}$$

#### **Caveats**

1. a disadvantage of LSDV is that it consumes a lot of degrees of freedom when the number of cross-sectional units, N, is very large, in which case we have to introduce N dummies (but suppress the common intercept term)

2. with so many variables, always the possibility of multicollinearity

3. LSDV may not be able to capture time-invariant variables

4. classical assumption for  $u_{it}$  may have to be modified:

##### **3. slope coefficients constant but the intercept value varies over individuals as well as time**

-will still work fine

##### **4. all coefficients vary across individuals**

-will not work for FEM with panel data

## 5. the intercept as well as the coefficients vary over individuals and time

-will not work for FEM with panel data

## 2. Error components ECM, Random effects REM

-alternative to FEM

-assumed that the intercept of an individual unit is a random drawing from a much larger population with a constant mean value; the individual intercept term is then expressed as a deviation from this constant mean value

-the error term is unobservable, or latent

-1 advantage of ECM over FEM is that it is economical in degrees of freedom, as we do not have to estimate N cross-sectional intercepts; we need only to estimate the mean value of the intercept and its variance

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \beta_3 X_{3it} + w_{it}$$

-ECM is appropriate in situations where the (random) intercept of each cross-sectional unit is uncorrelated with the regressors; whereas the FEM is better when the X's are correlated

**Hausman test**- can be used to decide between FEM and ECM

## Dynamic econometric models

-include current as well as lagged values of the regressors as well as models that include lagged values of the regressand as regressors

\***dynamic, lagged regression models**- regression models that take into account time lags

\***distributed-lag**- current and lagged values of regressors are explanatory variables

\***autoregressive**- lagged values of the regressand also appear as regressors

## Role of "time" or "lag" in economics

-the effect of I X on Y is rarely instantaneous, often there is a lag

$$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_k X_{t-k} + u_t$$

: distributed lag model with a finite lag of k time periods

\***short-run, impact multiplier**-  $\beta_0$ , because it gives the change in the mean value of Y following a unit change in X in the same time period

-when the change in X is maintained at the same level thereafter, the interim, or intermediate multipliers of :  $(\beta_0 + \beta_1)$  gives the value of the change (in the mean value of Y) in the next period,  $(\beta_0 + \beta_1 + \beta_2)$  in the following period and so on

:after k periods we finally obtain the **long-run, or distributed-lag multiplier**:

k



$$\sum_{i=0} \beta_i = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_k = \beta$$

### **Reasons for lags**

-for psychological, technological, and institutional reasons, a regressand may respond to a regressor with a time lag

#### **1. Psychological reasons**

-because of habit (inertia), people do not change their ways quickly

#### **2. Technological reasons**

-additional of capital takes time (gestation period)

#### **3. Institutional reasons**

-contractual obligations

### **Estimation of distributed lag models**

-purely distributed-lag model can be estimated by OLS, but in this case there is the problem of multicollinearity since successive lagged values of a regressor tend to be correlated

$$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_k X_{t-k} + u_t$$

\***infinite lag model**- where the length of the lag is not defined

\***finite distributed-lag model**- where the length of the lag is defined

:2 options for estimating the  $\alpha$  and  $\beta$ : 1) ad hoc 2) a priori restrictions on the  $\beta$ 's by assuming that the  $\beta$ 's follow some systematic pattern

#### **1. ad hoc estimation**

-since the explanatory variable  $X_t$  is assumed to be nonstochastic (or at least uncorrelated with the disturbance term  $u_t$ ),  $X_{t-1}$ ,  $X_{t-2}$ , and so on are nonstochastic too; therefore, we can use OLS to estimate the regression equation

-the process is one proceeds sequentially, that is, regress  $Y_t$  on  $X_t$ ; then regress  $Y_t$  on  $X_t$  and  $X_{t-1}$ ; then regress  $Y_t$  on  $X_t$ ,  $X_{t-1}$ , and  $X_{t-2}$ ; this sequential regression stops when the regression coefficients of the lagged variables start becoming statistically insignificant and/or the coefficient and/or the coefficient of at least 1 of the variables changes signs from positive to negative or vice versa

#### **Drawbacks of ad hoc**

1. there is no a priori guide as to the maximum length of the lag
2. as one estimates successive lags, there are fewer degrees of freedom left, making statistical inference somewhat shaky
3. in economic time series data tends to be correlated (multicollinearity)
4. sequential search for lag length can be interpreted as data mining

#### **2. Koyck approach**

$$\beta_k = \beta_0 \lambda^k \quad \text{where } k = 0, 1, \dots$$

-where  $\lambda$ , such that  $0 < \lambda < 1$ , is the **rate of decline**; and  $1 - \lambda$  is the **speed of adjustment**

-essentially, each successive  $\beta$  is numerically less than the preceding  $\beta$  (follows as  $\lambda < 1$ ), implying that as one goes further back into the past, the effect of that lag on  $Y_t$  becomes progressively smaller (common sense)

-the closer  $\lambda$  is to 1, the slower the rate of decline in  $\beta_k$  (former past values of  $X$  will exert sizable influence on  $Y_t$ ); whereas the closer  $\lambda$  is to 0, the more rapid the decline in  $\beta_k$  (the effect of past  $X$  values on  $Y_t$  will peter out quickly)

### Features of Koyck scheme

1. by assuming nonnegative values for  $\lambda$ , Koyck rules out the  $\beta$ s from changing signs
2. by assuming  $\lambda < 1$ , he gives lesser weight to the distant  $\beta$ 's than the current ones
3. he ensures that the sum of the  $\beta$ 's, which gives the long-run multiplier, is finite

$$Y_t = \alpha + \beta_0 X_t + \beta_0 \lambda X_{t-1} + \beta_0 \lambda^2 X_{t-2} + \dots + u_t \quad 1$$

lagged by 1 period:

$$Y_{t-1} = \alpha + \beta_0 X_{t-1} + \beta_0 \lambda X_{t-2} + \beta_0 \lambda^2 X_{t-3} + \dots + u_{t-1} \quad 2$$

multiplied by  $\lambda$ :

$$\lambda Y_{t-1} = \lambda \alpha + \lambda \beta_0 X_{t-1} + \beta_0 \lambda^2 X_{t-2} + \beta_0 \lambda^3 X_{t-3} + \dots + \lambda u_{t-1} \quad 3$$

subtracting 3 from 1 we get:

$$Y_t - \lambda Y_{t-1} = \alpha(1 - \lambda) + \beta_0 X_t + (u_t - \lambda u_{t-1}) \quad 4$$

where  $v_t = (u_t - \lambda u_{t-1})$  is the moving average of  $u_t$  and  $u_{t-1}$

**\*Koyck transformation**- obtaining moving averages to estimate the unknown variables and transform the parameter  $\lambda$  into linear form; just estimate the first  $\beta$  now

### Features of Koyck transformation

1. we started with a distributed lag but ended up with an autoregressive model, because  $Y_t$  is now a regressor
2.  $Y_{t-1}$ , like  $Y_t$  is nonstochastic, which violates classical OLS assumptions
3. disturbance term is  $v_t$  instead of  $u_t$ ; and  $v_t$  takes after  $u_t$ ; so if  $u_t$  is serially correlated,  $v_t$  may be as well
4. presence of lagged  $Y$  variables violates assumption of the Durbin  $d$  test; can use modified Durbin  $h$  test

-the partial sums of the standardized  $\beta_i$  tell us the proportion of long run, or total impact felt by a certain time period; though in practice the mean or median lag is used for this purpose

-summary measures of the speed with which  $Y$  responds to  $X$

### 1. median lag

-median lag is the time required for the first half, or 50%, of the total change in  $Y$  following a unit sustained change in  $X$

-median lag:  $-\log 2 / \log \lambda$

## 2. mean lag

-the weighted average of all the lags involved; lag-weighted average of time

-mean lag:  $\lambda / 1 - \lambda$

### Extensions of Koyck- rationalization of

-Koyck is ad hoc since it was obtained through an algebraic process; devoid of theoretical underpinning

#### 1. adaptive expectations model

$$Y_t = \beta_0 + \beta_1 X_t + u_t$$

-postulates that the demand for money is a function of expected (anticipated) rate of interest

since the expectational variable  $X$  is not directly observable,

$$X_t - X_{t-1} = \gamma(X_t - X_{t-1})$$

:known as the **adaptive expectation, progressive expectation, error learning hypothesis**

\***coefficient of expectation** =  $\gamma$ ; such that  $0 < \gamma < 1$

-implies that economic agents will adapt their expectations in the light of past experience and that in particular they will learn from their mistakes

-expectations are revised each period by a fraction  $\gamma$  of the gap between the current value of the variable and its previous expected value

-so, expectations about interest rates are revised each period by a fraction  $\gamma$  of the discrepancy between the rate of interest observed in the current period and what its anticipated value had been in the previous period

AEM:

$$Y_t = \gamma\beta_0 + \gamma\beta_1 X_t + (1-\gamma) Y_{t-1} + v_t$$

-lost steam with the advent of the **RE rational expectations hypothesis**, which assumes that economic agents use current available and relevant information in forming their expectations and do not rely purely upon past experience

-AE can still be defended as a working hypothesis proxying for a more complex, perhaps changing expectations formulation mechanism

#### 2. stock, partial adjustment model

-another rationalisation of Koyck is the PAM model

\***flexible accelerator model**- assumes that there is an equilibrium, desired, or long run amount of capital stock needed to produce a given output under the given state of technology, rate of interest, etc.

:desired level of capital,  $Y$ , is a linear function of output  $X$

$$Y_t = \beta_0 + \beta_1 X_t + u_t$$

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since the regressand is not directly observable

$$Y_t - Y_{t-1} = \delta(Y_t - Y_{t-1})$$

:known as the **partial adjustment, or stock adjustment hypothesis**

\***coefficient of adjustment**-  $\delta$ , such that  $0 < \delta < 1$

-actual change in capital stock (investment) in any given period  $t$  is some fraction  $\delta$  of the desired change for that period; if  $\delta = 1$ , it means the actual stock of capital is equal to the desired stock; actual stock adjusts to desired stock instantaneously (same time period)  
 -however, if  $\delta = 0$ , nothing changes since actual stock at time  $t$  is the same as that observed in the previous time period; typically,  $\delta$  is expected to lie between the 2 extremes since adjustment to the level of capital is likely to be incomplete due to: rigidity, inertia, contractual obligations, etc.; hence PAM

PAM:

$$Y_t = \delta\beta_0 + \delta\beta_1 X_t + (1-\delta) Y_{t-1} + \delta u_t$$

-can also be considered the short run demand for capital stock, opposed to  $Y_t$  which is the long run demand for capital stock

### **Comparisons**

-has a much simpler disturbance term than the AEM,  $\delta * u_t$   
 -AEM is based on uncertainty, whereas PAM is based on technical or institutional rigidities  
 -all give similar results, so the theoretical underpinning is of most significance  
 -a combination of AEM and PAM yields Friedman's permanent income hypothesis, which states that "permanent" or long run consumption is a function of "permanent" or long run income

### **Autoregressive estimation**

-as a result, some shortcut methods have been devised  
 -all 3 are autoregressive in nature  
 -autoregression also poses estimation challenges, primarily; if the lagged regressand is correlated with the error term, OLS estimators of such models are not only biased but also inconsistent  
 -bias and consistency are the case with the Koyck and adaptive expectations models; but the partial adjustment model can still be estimated by OLS despite the presence of the lagged regressand

#### **1. Koyck approach**

-purely algebraic approach

#### **2. adaptive expectations model**

-based on economic principles=

#### **3. stock adjustment model, partial adjustment model**

-based on economic principles

-to estimate the Koyck and AEM, use the **method of instrumental variable**

\***instrumental variable IV**- a proxy for the lagged regressand but with the property that it is uncorrelated with the error term

-but it is nearly difficult to find a good proxy for the IV, so maximum likelihood techniques typically must be used

\***SARG test** – can be used to find the proxy variable, IV

### **Autocorrelation in autoregressive models**

\***durbin h test**- used for detecting autocorrelation in autoregressive models

#### **h stats features**

1. does not matter how many X or lagged Y variables are included in the regression model; we only need to consider the variance of lagged Y
2. test is not applicable if variance exceeds 1
3. large sample test; been suggested that the BG or Lagrange multiplier test is more powerful in finite and large samples

### **Almon or polynomial distributed lag PDL Approach**

-whereas the Koyck assumes that the  $\beta$  coefficients decline geometrically as the lag lengthens, the Almon assumes a more cyclical pattern

-avoids the estimation problems associated with the autoregressive models

-major problem with Almon is that one must prespecify both the k and m

-follows Weierstrass' theorem: on a finite closed interval any continuous function may be approximated uniformly by a polynomial of a suitable degree

#### **Issues with**

1. maximum length of the lag, k, must be specified in advance
2. having specified k, we must also specify the degree of the polynomial m
3. once k and m are specified, we can construct the Z's (Almon coefficients)

-the Z variables are likely to exhibit multicollinearity

#### **Features of**

1. standard errors of the  $\alpha$  coefficients are directly obtainable from OLS regression, but the standard errors of the  $\beta$  coefficients, of primary interest, cannot be so obtained, can so through statistical software
2. may want to impose endpoint restrictions on the  $\beta$  coefficients
3. Akaike and Schwarz information criterion can be used to estimate k and m

### **Granger causality test**

-because of the lags involved, distributed lag and autoregressive models also raise the topic of causality in economic variables

-but one has to use great caution in the use of the Granger methodology, because it is very sensitive to the lag length used in the model

-a problem we see is that where is the causality of variables; often variables influence each other, but in time series only the past can affect the future, not the other way around

-assumes that the information relevant to the prediction of the respective variables is contained solely in the time series data on these variables

### **4 instances of causality**

1. unidirectional causality from M to GDP exists if the estimated coefficients on the lagged M are statistically different from 0

2. unidirectional causality from GDP to M exists if the set of lagged M coefficients is not statistically different from 0
3. feedback, or bilateral causality, is suggested when the sets of M and GDP coefficients are statistically different from 0 in both regressions
4. independence is suggested when the sets of M and GDP coefficients are not statistically significant in both the regression

### **Causality and Exogeneity**

-economic variables can be exogenous or endogenous

1. weak exogeneity- estimating and testing
2. strong exogeneity- forecasting
3. super exogeneity- needed for policy analysis

-despite the estimation problems, which can be surmounted, the distributed lag and autoregressive models have proved extremely useful in empirical economics because they make the otherwise static economic theory a dynamic one by taking into account explicitly the role of time; such models help us to distinguish between short and long run response of the dependent variable to a unit change in the explanatory variable: helpful for estimating short and long run price, income, substitution, and other elasticities

\***Sims' test of causality**- similar to Granger

\***SARG test**- for validity of the instruments

\***triangular, arithmetic distributed-lag model**- this model assumes that the stimulus (explanatory variable) exerts its greatest impact in the current time period and then declines by equal decrements to 0 as one goes into the distant past

\***inverted V distributed lag model**- follows an inverted V graphical depiction

\***interaction term**- the combination of 2 variables

### **Simultaneous Equation Models**

#### **Nature of**

-when multiple explanatory variables affect each other at the same time

\***endogenous variables**- jointly dependent variables

\***exogenous, predetermined variables**- the variables that are truly nonstochastic or can be so regarded

-when Y is determined by the X's, and some of the X's are determined by Y

-better to lump together a set of variables that can be determined simultaneously by the remaining set of variables: simultaneous equation model

-there are multiple equations, 1 for each of the mutually or jointly dependent or exogenous variables

-one must consider all equations before estimating the parameters of 1

-violates the OLS assumption that the regressors are either nonstochastic, or if stochastic, are distributed independently of the stochastic term

-the OLS estimators are not consistent, they do not converge to their true population values no matter how large the sample size

**Examples of**

1. demand and supply model
2. Keynesian model of income determination
3. wage-price models
4. IS model of macroeconomics
5. LM model
6. econometric models

**Simultaneous Equation Bias**

- \***probability limit, plim**- estimator is consistent if this is equal to its population value
- is not the case for these models
- OLS estimators are inconsistent

**The Identification Problem**

- must discuss the topic of the identification problem before one can analyze estimation techniques for simultaneous equation models
- \***identification problem**- if in a system of simultaneous equations containing 2 or more equations it is not possible to obtain numerical values of each parameter in each equation because the equations are observationally indistinguishable
- how do we know if we are estimating the supply or the demand function from P and Q

**Notations and definitions****2 types of variables in simultaneous equation models****1. endogenous**

- values are predetermined within the model (stochastic)

**2. predetermined**

- values are determined outside the model (nonstochastic)
- values are not determined by the model in the current time period
- temperature, rainfall
- A. exogenous- current as well as lagged
- B. lagged endogenous

\***structural, behavioural equations**- the equations comprising the model;

\***structural parameters, coefficients**-  $\beta$ 's and  $\lambda$ 's

$$0 < \beta_1 < 1$$

consumption function:  $C_t = \beta_0 + \beta_1 Y_t + u_t$

identity *identity*:  $Y_t = C_t + I_t$

-C and Y are endogenous variables, with I being exogenous

**\*reduced form equation**- one that expresses an endogenous variable solely in terms of the predetermined variables and the stochastic disturbance term

**\*reduced form coefficients**-  $\Pi_0$   $\Pi_1$

-substitute consumption into income:  $Y_t = \Pi_0 + \Pi_1 I_t + w_t$

where:  $\Pi_0 = \beta_0 / (1 - \beta_1)$

$\Pi_1 = 1 / (1 - \beta_1)$

$w_t = u_t / (1 - \beta_1)$

**\*impact, short-run multipliers**  $= \Pi_0 + \Pi_1$  play a crucial role; they measure the immediate impact on the endogenous variables of a unit change in the value of the exogenous variable

-exogenous variables are very important in econometrics; very often they are under the direct control of the government, such as tax rates, subsidies, unemployment compensation etc.

**\*indirect least squares ILS**- can be used on the reduced form to get estimated structural coefficients

### **The identification problem**

-asks if one can obtain unique numerical estimators of the structural coefficients from the estimated reduced-form coefficients; if this can be done, an equation of simultaneous equations is identified; if not, it is un or under identified

-arises because different sets of structural coefficients can may be compatible with the same set of data; a given reduced-form equation may be compatible with different structural equations or different hypotheses (models), and it may be difficult to tell which particular hypotheses (model) we are investigating

-the model as a whole is identified if each equation in it is identified; to secure identification, we resort to reduced-form equations

#### **1. Underidentified**

-we cannot estimate 4 structural coefficients from 2 reduced-form equations; we would need at least 4 equations

-given time series data on P and Q and no other information, the researcher cannot guarantee whether he is estimating the demand or supply function

-we need more data like tastes for demand and weather conditions for supply

-otherwise, we have a mongrel equation (same as what he already have) or a supply function that we want to use to estimate demand, which is not feasible

#### **2. Just, exact identification**

-unique values of structural coefficients can be obtained

-if we add Income to the demand equation we can now estimate it

-the inclusion of an additional variable into the demand function allows us to estimate the supply function



-including an additional variable into the supply function, price lagged 1 period, yields us with 6 structural coefficients and 6 reduced form equations

### 3. Overidentification

- there may be more than 1 value for 1 or more than 1 structural parameters
- we have 8 reduced form equations and 7 structural coefficients

### Rules for identification

- the identification problem arises because the same set of data may be compatible with different sets of structural coefficients, that is, different models
- thus, in the regression of price on quantity it is difficult to tell whether one is estimating the supply or the demand function, because price and quantity enter both equations
- \*reduced-form equations-** used to assess the identifiability of a structural equation; expresses an endogenous variable solely as a function of predetermined variables

#### 1. order condition

- easy to apply, but provides only a necessary condition for identification
- for an equation to be identified, it needs to exclude at least  $M-1$  variables (endogenous as well as predetermined) appearing in the model; If it excludes exactly  $M-1$  variables, the equation is just identified; if it excludes more than  $M-1$  variables it is overidentified
- \*order-** refers to the order of a matrix; that is, the  $\#$  of rows and columns present in a matrix
- \*exclusion (of variables) criterion, 0 restrictions criterion (the coefficients of variables not appearing in an equation are assumed to have 0 values)** – identification of an equation in a model of simultaneous equations is possible if that equation excludes 1 or more variables that are present elsewhere in the model; but the researcher must clearly spell out why he left out specific variables for each equation
- is a necessary but not sufficient condition for identification

#### 2. rank condition

- is both a necessary and sufficient condition for identification
- if the rank condition is satisfied, the order condition is satisfied too; but this is not reciprocal for the order condition
- but in practice the order condition is generally adequate to ensure identifiability
- \*rank-** refers to the rank of a matrix and is given by the largest-order square matrix (contained in the given matrix) whose determinant is nonzero; alternatively, the rank of a matrix is the largest number of linearly dependent rows or columns of the matrix
- rank condition-** in a model containing  $M$  equations in  $M$  endogenous variables, an equation is identified iff at least 1 nonzero determinant of order  $(M-1)(M-1)$  can be constructed from the coefficients of the variables (both endogenous and predetermined) excluded from that particular equation but included in the other equations of the model
- the rank condition tells us whether the equation under consideration is identified or not, whereas the order condition tells us if it is exactly identified or overidentified
- it is usually sufficient to ensure identifiability with the order condition

### Test of simultaneity

- a test of simultaneity is essentially a test of whether (an endogenous) regressor is correlated with the error term; we cannot use OLS
- in the presence of simultaneity one must use the 2SLS or instrumental variables
- \***Hausman specification test**- can be used to determine whether a variable or group of variables is endogenous or exogenous

### Test for exogeneity

- see if the variables are endogenous or exogenous
- although related, the concepts of causality and exogeneity are different and one may not necessarily imply the other
- get reduced form equations, use the Hausman test, and then analyze the hypothesis; if the hypothesis is rejected, the variables are endogenous, but if it isn't rejected, the variables are deemed exogenous

## Simultaneous Equation Methods

### Approaches to estimation

- assuming that an equation in a simultaneous-equation model is identified (exactly or over), there are 2 methods for estimation: single-equation and systems
- for reasons of economy, specification errors etc., the single-equation methods are by far the most popular
- 1. single-equation methods, limited information**- estimate each equation in the system (of simultaneous equations) individually, taking into account any restrictions placed on that equation (such as exclusion of some variables) without worrying about the restrictions on the other equations in the system, hence limited information
- 2. system methods, full information**- estimate all the equations in the model simultaneously, taking due account of all restrictions on such equations by the omission or absence of some variables (for identification such restrictions are essential), hence full information
- to preserve the essence of simultaneous equation models, one should use the systems method, such as the **full information maximum likelihood method FIML**; but in actuality, this is practical for several reasons:
  1. incuriosity of data
  2. produce nonlinear in the parameters solutions
  3. very sensitive to specification errors; that error becomes transmitted to the entire system

- a useful feature of the single-equation methods is that one can estimate a single-equation in a multiequation model without worrying too much about other equations in the system; however, for identification purposes the other equations in the system count
- 3 commonly used single-equation methods are OLS, ILS, 2SLS

## 1. Recursive models and OLS

-triangular, recursive, or causal model

-called triangular because if we form the matrix of the coefficients of the endogenous variables, we get a triangular matrix

-OLS is inappropriate in the context of simultaneous-equation models, it can be applied to so called recursive models where there is a definite but unidirectional cause-and-effect relationship among the endogenous variables

-because the stochastic disturbance term and the endogenous explanatory variable have interdependence, OLS cannot be applied to simultaneous equations; the estimators become bias and inconsistent

-recursive methods use same-period disturbances in different equations that are uncorrelated (**zero contemporaneous correlation**)

$$Y_t = \beta_{10} + \lambda_{11}X_{1t} + \lambda_{12}X_{2t} + u_{1t}$$

$$Y_t = \beta_{20} + \beta_{21}Y_{1t} + \lambda_{21}X_{1t} + \lambda_{22}X_{2t} + u_{2t}$$

$$Y_t = \beta_{30} + \beta_{31}Y_{1t} + \beta_{32}Y_{2t} + \lambda_{31}X_{1t} + \lambda_{32}X_{2t} + u_{3t}$$

-because the stochastic disturbance term and the endogenous explanatory variable have interdependence, OLS cannot be applied to simultaneous equations; the estimators become bias and inconsistent

-the disturbances are such that:  $\text{cov}(u_{1t}, u_{2t}) = \text{cov}(u_{1t}, u_{3t}) = \text{cov}(u_{2t}, u_{3t}) = 0$

-recursive methods use same-period disturbances in different equations that are uncorrelated (**zero contemporaneous correlation**)

-OLS can now be applied because the endogenous explanatory variables Y are uncorrelated with the equation's disturbance terms

-thus, in the recursive system, OLS can be applied to each equation separately; this is not simultaneous-equations, but we do have no interdependence of the endogenous variables; Y1 affects Y2, but Y2 does not affect Y1; each equation exhibits a unilateral causal dependence, hence **causal models**

-although recursive models have proved to be useful, most simultaneous-equation models do not exhibit such a unilateral cause-and-effect relationship; therefore, OLS in general, is inappropriate to estimate a single-equation in the case of a simultaneous-equation model

-however, OLS can still be used as a norm for comparison, as the results sometimes do not differ that much

## 2. ILS

-suited for just or exactly identified equations; in this method OLS is applied to the reduced-form equation, and it is from the reduced-form coefficients that one estimates the original structural coefficients

**Steps**

1. obtain reduced form equations
  2. apply OLS to the reduced-form equations individually
  3. obtain estimates of the original structural coefficients from the estimated reduced-form coefficients
- the name ILS derives from the fact that structural coefficients (object of primary enquiry in most cases) are obtained indirectly from the OLS estimates of the reduced form coefficients
  - ILS estimators still are biased in small samples

### **3. 2SLS**

- especially designed for overidentified equations, although it can also be applied to exactly identified equations, but then the results of 2SLS and ILS are identical
- the basic idea behind 2SLS is to replace the stochastic (endogenous) explanatory variable by a linear combination of the predetermined variables in the model and use this combination as the explanatory variable in lieu of the original endogenous variable
- the 2SLS method thus resembles the **instrumental variable method** of estimation in that the linear combination of the predetermined variables serves as an instrument, or proxy, for the endogenous regressor
- must find a proxy for  $Y_1$  so it is uncorrelated with  $u_2$

#### **2 steps**

1. regress  $Y_1$  on all the predetermined variables in the whole system, not just that equation, to get rid of the likely correlation between  $Y_1$  and  $u_2$
2. apply OLS to the overidentified money supply equation

-basic idea behind 2SLS is to “purify” the stochastic explanatory variable  $Y_1$  of the influence of the stochastic disturbance  $u_2$ ; this goal is accomplished by performing the reduced-form regression of  $Y_1$  on all the predetermined variables in the system (stage 1), obtaining the estimates of  $Y_{1t}$  and replacing  $Y_{1t}$  with the new estimated  $Y_{1t}$ , and then apply OLS to the equation thus transformed (stage 2); the estimators obtained are consistent; that is, they converge to their true values as the sample size increases indefinitely

#### **Features of:**

1. can be applied to an individual equation without directly taking into account any other equations in the system; for models with many equations, this method is the best
2. unlike ILS, which provides multiple estimates of parameters in the overestimated equations, 2SLS provides only 1 estimate per parameter
3. easy to apply, because all one needs to know is total number of exogenous or predetermined variables without knowing any other variables in the system
4. can also be used for exactly identified equations
5. need high R-squared values
6. can use standard errors because we use OLS, not ILS

-2SLS and ILS are similar in that the estimates obtained are consistent; that is, as the sample size increases indefinitely, the estimates converge to their true population values –however, the estimates may not satisfy small-sample properties, such as unbiasedness

and minimum variance; therefore, the results obtained by applying these methods to small samples and the inferences drawn from them should be interpreted with due caution

### **Time Series Econometrics: Basics**

-regression analysis based on time series data implicitly assumes that the underlying time series are stationary; classical F tests, t tests etc. are based on this assumption; in practice, most time series are nonstationary

#### ***Issues with Time Series Data***

1. empirical work on series data assumes the underlying time series is stationary
2. autocorrelation can result because the underlying time series is nonstationary
3. spurious, nonsense regression- get a high  $R^2$  when there is no meaningful relationship
4. some financial time series exhibit the random walk phenomenon
5. time series data commonly used for forecasting; is it valid if the time series data is not stationary
6. tests of stationarity should precede tests of causality (Granger and Sims causality tests assume stationarity)

### **US Time Series**

1. GDP- gross domestic product
  2. PDI- personal disposable income
  3. PCE- personal consumption expenditure
  4. profits- corporate profits after tax
  5. dividends- net corporate dividends
- US Department of Commerce; Bureau of Economic Analysis; Business Statistics

### **Key Concepts**

**\*data generating process DGP-** the mechanism we must determine for continued replication of a time series

#### ***1. stochastic processes***

-comes from Greek stochos- meaning bullseye or target  
 -a random or stochastic process is a collection of random variables ordered in time  
 -continuous would be electrocardiogram and discrete would be GDP (discrete points in time)

**\*realization-** depiction of all such possibilities

-GDP is a stochastic process and this sample is a particular realization of that process  
 -stochastic is to realization as population is to sample  
 -we use the realization to draw inferences about the underlying stochastic process

#### ***2. stationary stochastic processes***

**\*ssp-** when its mean and variances are constant over time and the value of the covariance between the 2 time periods depends only on the distances or gap or lag between the 2 time periods and not the actual time at which the covariance is computed

**1. weakly stationary, covariance stationary, second-order stationary, wide sense stochastic process**- the stochastic process's mean, variance, and autocovariance are constant over time, they are **time invariant**

-such a time series will revert to its mean (mean reversion) and fluctuations around this mean (measured by the variance) will have a broadly constant amplitude

**2. nonstationary time series**- has a time-varying mean or time-varying variance or both; opposite of weakly stationary in the purely weakly stationary sense (i.e., average stationary and strong stationary)

-nonstationary time series data is impractical for forecasting purposes; can study its behaviour only for that 1 period

### **3. purely random stochastic process**

**\*pr, white noise process**- when the stochastic process has 0 mean, constant variance  $\sigma^2$ , and is serially uncorrelated; random variable  $u_t$  of CLNRM is a white noise variable  $u_t \sim \text{IIDN}(0, \sigma^2)$ ; where  $u_t$  is independently and identically distributed as a normal distribution with 0 mean and constant variance

-also called strictly white noise if it is independent

### **4. nonstationary stochastic process**

-stocks and such follow a **random walk model RWM**

#### **1. random walk without drift**

-the mean of  $Y$  is equal to its initial value, but as  $t$  increases, its variance increases indefinitely, violating a condition of stationarity

-RW remembers the shocks forever, it has infinite memory; persistence of random shocks

-this is the efficient markets hypothesis

#### **2. random walk with drift**

-adds in the **drift parameter  $\delta$**  to the RWM

-RWM with drift the mean as well as the variance increases over time, violating the conditions of weak stationarity

-RWM, with or without drift, is a nonstationary stochastic process

-RWM is an example of a **unit root process**

### **5. unit root stochastic process**

$$Y_t = \rho Y_{t-1} + u_t$$

6

:resembles Markov first-order autoregressive model

-if  $\rho = 1$ , then 6 becomes RWM without drift; if  $\rho$  is in fact 1, we face the **unit root problem**, which is a situation of nonstationarity (in this case the variance of  $Y_t$  is not stationary)

-if  $|\rho| < 1$ , then the time series  $Y_t$  is stationary

-it is important to determine if a time series possesses a unit root; tests of stationarity are tests of unit roots

-nonstationarity, random walk, and unit root can be treated as synonymous

### **6. trend stationary TS and difference stationary DS stochastic process**

-the distinction between stationary and nonstationary stochastic processes (or time series) has a crucial bearing on whether the trend observed in the constructed time series or in the actual economic time series is deterministic or stochastic

**1. deterministic**- the time series trend is completely predictable and not variable

**2. stochastic**- the time series trend is not predictable

**\*trend**- the slow long-run evolution of the time series under consideration

### 1. pure random walk

$$Y_t = Y_{t-1} + u_t$$

:RWM without drift and is therefore nonstationary

$$\Delta Y_t = (Y_t - Y_{t-1}) + u_t$$

:becomes stationary; hence random walk without drift is a **difference stationary process**

### DSP

### 2. random walk with drift

$$Y_t = \beta_1 + Y_{t-1} + u_t$$

:RWM without drift and is therefore nonstationary

$$(Y_t - Y_{t-1}) = \Delta Y_t = \beta_1 + u_t$$

:means that  $Y_t$  will exhibit a positive ( $\beta_1 > 0$ ) or negative trend ( $\beta_1 < 0$ ); known as a

**stochastic trend**

### 3. deterministic trend

$$Y_t = \beta_1 + \beta_2 t + u_t$$

:known as a **trend stationary process TSP**

-although the mean of  $Y_t$  is  $\beta_1 + \beta_2 t$ , which is not constant, its variance ( $=\sigma^2$ ) is; once the values of  $\beta_1$  and  $\beta_2$  are known, the mean can be forecast perfectly; therefore, if we subtract the mean of  $Y_t$  from  $Y_t$ , the resulting series will be stationary, hence trend stationary

**\*detrending**- the process of removing the deterministic trend, thus making the time series trend stationary

### 4. random walk with drift and deterministic trend

$$Y_t = \beta_1 + \beta_2 t + Y_{t-1} + u_t$$

:has a random walk with drift and a deterministic trend, which can be seen from

$$\Delta Y_t = \beta_1 + \beta_2 t + u_t$$

:which means that  $Y_t$  is stationary

### 5. deterministic trend with stationary AR(1) component

$$Y_t = \beta_1 + \beta_2 t + \beta_3 Y_{t-1} + u_t$$

:which is stationary around the deterministic trend

-in the case of the deterministic trend, the deviations from the trend line (which represents nonstationary mean) are purely random and they die out quickly; they do not contribute to the long-run development of the time series, which is determined by the trend component  $0.5t$

-in the case of the stochastic trend the random component  $u_t$  affects the long-run course of the series  $Y_t$

**1. trend stationary**- has a deterministic trend

**2. difference stationary**- has a variable, stochastic trend

-the common practice of including the time or trend variable in a regression model to detrend the data is justifiable only for TS time series

-DF and ADF tests can be applied to determine if a time series is TS or DS

### **7. integrated stochastic process**

-the RWM is a specific case of a more general class of stochastic processes known as integrated processes

**1. integrated of order 1**- time series that has to be differentiated once; RWM without drift

**2. integrated of order d**- time series that has to be differentiated d times to make it stationary

**3. integrated of order 0, stationary time series**- when the time series is stationary to begin with

-most economic time series are generally I(1); that is, they become stationary after taking their first differences

-one must be careful when combining multiple time series of different orders; if  $Y_t$  is I(0), but  $X_t$  is I(1), then the former is stationary and the latter is not; since  $X_t$  is nonstationary, its variance will increase indefinitely, thus dominating the numerator term and resulting in  $\beta_2$  converging to 0 asymptotically even though it does not have an asymptotic distribution

### **8. spurious regression**

\***spurious regression**- nonsensical or spurious results from regressing 1 time series variable on 1 or more time series variables

$R^2 > d$  ; means the estimated regression is spurious; very low  $R^2$  and d values in general

-be very careful with time series data exhibiting stochastic trends, and be very careful with I(1) variables

### **Tests of Stationarity**

-how do we find out if a time series is stationary, and then how do we make it stationary

#### **1. graphical analysis**

-get an intuitive feel for the data

#### **2. Autocorrelation function ACF and correlogram**

-tests weak stationarity; a graph of autocorrelation at various lags; for stationary time series the correlogram tapers off quickly, for nonstationary time series it dies off gradually; for a purely random series, the autocorrelation at all lags 1 and greater are 0

-population correlogram and sample correlogram; population SFC and sample AFC

-sample AFC gives us the data for the sample correlogram

-if the correlogram is:

#### **1. purely white noise random process**

-various lags will hover around 0 in the AC column, will be positive and negative; stationary time series

#### **2. random walk process**

-the AC coefficient starts at very high values and declines very slowly towards 0 as the lag lengthens; nonstationary time series; GDP and most economic data

### **2 issues**



**1. Lag length**

-empirical issue; generally 1/3 to 1/4 the length of the time series  
 -best to start at sufficiently large lags and then decrease them by some statistical criterion, such as Akaike Schwarz information criterion or other tests

**2. Statistical significance of autocorrelation coefficients****1. individual lag standard errors**

-get the variance and resulting standard error of the sample for the observation; test at 95% confidence or whatever

**2. Box-Pierce Q-statistic**

-tests the joint hypothesis that all the standard errors  $\rho_k$  up to certain lags are simultaneously equal to 0  
 -approximates chi-squared in large samples, so one can use the computed Q against critical Q value to test the hypothesis

**3. Ljung-Box LB statistic**

-more powerful in small sample properties than the BP

**Unit Root Test**

-when time series are nonstationary they contain a unit root  
 -another test of stationarity or nonstationarity that has become popular  
 -at the formal level, stationarity can be checked by finding out if the time series contains a unit root

$$Y_t = \rho Y_{t-1} + u_t$$

7

-we know that if  $\rho=1$ , in the case of the unit root, then 7 becomes a RWM without drift, which is nonstationary stochastic process; therefore, simply regress  $Y_t$  on its 1 period lagged value of  $Y_{t-1}$  and find out if the estimated  $\rho$  is statistically equal to 1, if it is then  $Y_t$  is nonstationary

**1. Dickey-Fuller DF**

-have shown that under the null hypothesis that  $\delta=0$ , the estimated t value of the coefficient  $Y_{t-1}$  follows the tau statistic  
 -thus, if the hypothesis that  $\delta=0$  is rejected (the time series is stationary), we can use the usual Student's t distribution  
 -utilizes the tau statistic, generated from Monte Carlo experiments

***-estimated in 3 forms:***

- 1)  $Y_t$  is a random walk
- 2)  $Y_t$  is a random walk with drift
- 3)  $Y_t$  is a random walk with drift around a stochastic term

-the critical values of the tau test to test the hypothesis that  $\delta=0$  are different for each of the 3 forms

**2. augmented Dickey-Fuller ADF**

-for use when the error terms  $u_t$  are correlated; augments the 3 equations

**3. F test**

-can use the restricted F tests; uses DF critical values

**4. Phillips-Perron PP test**

-use nonparametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms

***Issues with unit root tests***

-most unit root tests are based on the hypothesis that the time series under consideration has a unit root or is nonstationary; the alternative hypothesis is that the time series is stationary

**1. size**

\***size**- level of significance; probability of committing a Type I error

-nominal and true levels of significance are important if one chooses the wrong of the 3 equations to use

-size distortion could also result from excluding moving average MA components from the model

**2. power**

\***power**- probability of rejecting the null hypothesis when it is false; 1- Type II error

-most DF tests have low power; that is, they will accept the null of unit root more frequently than is warranted; may find a unit root even when none exists

reasons for:

1. the power depends on the time span of the data more than the sample size
2. if  $\rho=1$  but not exactly 1, the unit root test may declare such a time series nonstationary
3. assumes a single unit root; if there are higher orders used, will be more than 1 unit root; can use the **Dickey-Pantual test** for this
4. does not catch structural breaks well

**Transforming nonstationary time series****1. DSP**

-if the time series has a unit root, then just take the difference to make it stationary

**2. TSP**

-just detrend the time series

\***underdifferencing**- if a time series is DSP but is treated as TSP

\***overdifferencing**- if a time series is TSP but is treated as DSP

-most macroeconomic time series are DSP and not TSP

**Cointegration**

-PCE and PDI are I(1) individually (have stochastic trends), but their linear combination is I(0)

-economic variables will be cointegrated if there is a long-term or equilibrium relationship between them

-so unit tests and cointegration tests help us test for stationarity and avoid spurious regression situations

\***cointegration**- despite being individually stationary, a linear combination of 2 or more time series can be stationary; EG, AEG, CRDW tests can determine this; cointegrating regression and cointegrating parameter

-cointegration of 2 or more time series suggests there is a long-run, or equilibrium relationship between them

**1. Engle-Granger EG or Augmented AEG tests**

-regress and equation, obtain the residuals and use the DF and ADF tests

-EG developed new critical values to use for this

-builds on the DF and ADF tests

## **2. cointegrating regression Durbin-Watson test CRDW**

-quicker method

**-both tests are now supplemented by the Johansen method**

\***error correction mechanism**- Engle and Granger; is a means of reconciling the short-run behaviour of an economic variable with its long-run behaviour

\***Granger representation theorem**- if 2 variables, X and Y are cointegrated, then the relationship between the 2 can be expressed as ECM

-correlogram may still be the best tool

Time Series Econometrics: Forecasting

### Approaches to economic forecasting

#### **1. exponential smoothing methods**

-fit a suitable curve to historical data of a given time series; Holt's

#### **2. single-equation regression methods**

-does not do well for far out future periods

#### **3. simultaneous equation regression methods**

\***Lucas critique**- estimated parameters of an economic model are not invariant in the presence of policy changes

#### **4. ARIMA**

-analyzes the probabilistic or stochastic properties of economic time series on their own to let the data speak for themselves

\***atheoretic models**- not derived from economic theory; simultaneous equation models are derived from economic theory

#### **5. VAR**

-superficially resembles simultaneous-equation models in that one considers several endogenous variables together; but, each endogenous variable is explained by its lagged values and lagged values of the other endogenous variables; usually there are no exogenous variables

### AR, MA, and ARIMA

-modelling of time series data

#### **1. Autoregressive AR process**

-the value of Y depends on its value in the previous time period and an error term

-kind of reduced form model that lets the data speak for themselves AR(p)

#### **2. Moving average MA process**

-the value of Y depends on the constant plus a moving average of current and past values

-MA(q); MA is a linear combination of white noise error terms

#### **3. autoregressive and moving average ARMA process**

-ARMA(p,q) process, there will be p autoregressive and q MA terms

#### **4. autoregressive integrated moving average process ARIMA**

-used when the time series is not weakly stationary, when it is integrated

-use this model when we take the difference of the time series model to make it stationary

## **Box-Jenkins BJ Method**

### *Steps*

#### **1. identification**

-find the appropriate values of p,d, and q

1. first examine for stationarity; chief tools are autocorrelation function ACF partial autocorrelation function PACF or a formal unit root analysis; and the resulting correlograms is a good visual tool
2. if the time series is not stationary, difference it 1 or more times
3. the ACF and PACF are then computed to find out if the series is purely autoregressive or purely of the moving average type or a mixture of the 2; one can then determine the values of p and q in the ARMA process to be fitted; at this stage the chosen ARMA(p,q) model is tentative

#### **2. estimation**

estimate the parameters of the MA and AR terms in the model

#### **3. diagnostic checking**

- are the estimated residuals white noise; if yes proceed, if not go back to step 1
- if they are, then the tentative model is a good approximation for the underlying stochastic process; if not start over, BJ is an iterative procedure

#### **4. forecasting**

-works especially best for short-term forecasts

-BJ can also be used to account for seasonality and multiple time series

## **VAR**

-Sims said that of there was true simultaneity among a set of variables, they should all be treated on equal footing; there should not be any a priori distinction between exogenous and endogenous variables

-autoregressive due to the appearance of lagged values of the dependent variable on the right side; vector due to having a vector with 2 or more variables

-estimating and forecasting depends primarily on the choice of the lag

-the u's, or stochastic error terms are called impulses or innovations or shocks in VAR

### **Features of:**

1. is a truly simultaneous system in that all variables are regarded as endogenous
2. in VAR models, the value of a variable is expressed as a linear function of the lagged values of that variable and all other variables included in the model
3. if each equation contains the same amount of lagged variables in the system, it can be estimated by OLS without resorting to any systems method; such as 2SLS or SURE seemingly unrelated regressions

### **Issues with VAR**

1. unlike simultaneous equation models, VAR is atheoretic, because it uses less prior information
2. biggest challenge is choosing the appropriate lag length
3. transforming the data can be difficult

4. because of its emphasis on forecasting, not good for policy analysis
  5. if there are several lags in each equation, it is not always easy to interpret each coefficient, especially if the signs of the coefficients alternate; for this reason one examines the **impulse response function IRF** in VAR models to find out how the dependent variable responds to a shock administered to 1 or more equations in the system
  6. this simplicity of VAR has its drawbacks; in view of the limited number of observations available in most economic analyses, introduction of several lags of each variable can consume a lot of degrees of freedom
- VAR and causality results are mixed

- no one exact model: single-equation, simultaneous equation, VAR, BJ

### **ARCH and GARCH**

- autoregressive conditional heteroscedasticity (generalized)
- measuring volatility in financial time series, such as stock prices, inflation, and exchange rates
- these time series are a random walk in their level forms; yet they are stationary in their difference terms; but these first differences exhibit great swings or volatility, suggesting the variance of financial time data varies over time
- a distinguishing feature of these models is that the error variance may be correlated over time because of the phenomenon of volatility clustering
- \***volatility clustering**- periods that exhibit wide swings for an extended time period followed by a period of comparative tranquillity
- if the ARCH effect is found, we have to use GLS
- a significant DW d statistic may be due to the ARCH or GARCH effect
- GARCH says the conditional variance of  $u$  at time  $t$  depends not only on the squared error term in the previous time period [ARCH(1)], but also on its conditional variance in the previous time period
- GARCH (p,q) where there are  $p$  lagged terms of the squared error term and  $q$  terms of the lagged conditional variances
- GARCH (1,1) is equal to ARCH(2);  $GARCH(p,q) = ARCH(p+q)$

- 2) maximum likelihood ML**- consists in estimating the unknown parameters in such a manner that the probability of observing the given  $Y$ 's is as high as possible
- when the population disturbances are normally distributed with 0 mean and constant variance, ML and OLS are equal
  - OLS estimator of variance takes into account DF, while ML does not; if DF is large, no difference
  - must make an assumption about the probability distribution of disturbance term  $u$ ; usually assume it follows the normal distribution

**\*likelihood function**- has to do with joint PDF; maximum probability of a result under 2 different hypotheses

**\*log-likelihood test**- statistical test for making a decision between 2 hypotheses based on the value of this ratio

**3) method of moments MOM**- sample mean used to estimate population mean

A) Small sample properties: unbiasedness, minimum variance, best unbiased, or efficient estimator, linearity, BLUE, minimum mean-square-error MSE estimator

B) Large sample properties: asymptotic unbiasedness, consistency, asymptotic efficiency, asymptotic normality

## V. Statistical Inference: Hypothesis Testing

INNOCENT TIL PROVEN (Researched) GUILTY

---null-----alternative-----

-we need to determine probability distributions for the estimators, or random variables of the sample, to relate them to the true population parameters

**-CNLRM**- classical normal linear regression model: assumes the normally distributed of the disturbance term,  $u$ ;

**\*central limit theorem**- used in the normality assumption; if there a large amount of independent and identically distributed random variables, they will find a normal distribution

-for 2 normally distributed variables,  $u$  and  $u$ ; 0 covariance or correlation means independence of the variables

### Normality assumption

-new assumption for OLS estimators

1) they are unbiased

2) they have minimum variance: combined with 1, means that they are **minimum-variance unbiased**, or **efficient estimators**

3) they have consistency

4) follows the **standard normal distribution**

5) is distributed as **chi-squared**, with  $(n-2)$  df

6) estimators distributed independently of  $\sigma^2$

7) **\*best unbiased estimators BUE**- they have minimum variance in the entire class of unbiased estimators

**\*null**- are equal; simple

-reject the null, the finding are **statistically significant at the 5% significance level**

-do not reject the null, the findings are **not statistically significant**

**\*alternative**- are not equal; composite

**\*simple**- specifies the values of the parameters of the distribution; mean and variance

\***composite**- does not specify values of the parameters

\***p-value**- includes possibility of making a Type I error; weighs results in relation to other measures, not just yes or no

-the probability of observing a test statistic at least as extreme as the 1 computed given that the null hypothesis is true; based on the sampling distribution

*The probability of observing a sample mean at least as large as 178 from a population whose mean is 170 is .0069, very small. Reject null*

*There is or isn't enough statistical evidence to infer that XX is true or false*

*You cannot make a probability statement about a parameter like the null hypothesis, it is not a random variable; p-value is not probability that null is true*

*It measures the amount of statistical evidence available to support the alternative hypothesis*

- 1) If p-value is less than .01, overwhelming evidence to infer that alternative hypothesis is true; test is highly significant
  - 2) If p-value is between .01 and .05, strong evidence to infer that alternative hypothesis is true; results are deemed to be significant
  - 3) If p-value is between .05 and .10, weak evidence to infer that alternative hypothesis is true; result is not statistically significant
  - 4) If p-value exceeds .10, no evidence to infer alternative hypothesis is true
- or less or greater than to alpha, reject or don't

-never prove anything, only make an inference

-research hypothesis comes first, then null to specify equality

## **2 possible conclusions**

-the conclusion is based on the alternative (research) hypothesis

-whatever is trying to be proven must be shown by the research hypothesis

-3 choices: parameter is greater than, not equal to, or less than value specified in null hypothesis

- 1) reject null hypothesis; conclude that there is enough statistical evidence to infer that the alternative hypothesis is true
- 2) fail to reject null hypothesis; conclude that there is not enough statistical evidence to infer that the alternative hypothesis is true

### ***to test null hypothesis:***

1) use the sample information to obtain test statistic; point estimator of the unknown parameter

-standardized test statistics, Z or p, are better than mean

2) find the sampling or probability distribution of the test statistic

3) use the confidence interval or test of significance approach to test the null hypothesis

-i.e., how do we decide if estimate  $\bar{X}$  is sufficiently close to  $\mu$

## **Two-tailed test**

1) conducted when the research hypothesis specifies that the mean is not equal to the value stated in the null hypothesis

## **One-tailed test**

- 1) conducted to focus on right tail of sampling distribution to infer if mean is greater than quantity specified in null
- 2) conducted to focus on left tail of sampling distribution to infer if mean is less than value specified in the null

### 1) Confidence interval approach

- the proportion of times the procedure would be correct, if the sampling procedure were repeated a very large number of times
- if the estimate lies within the confidence interval, we may not reject the null hypothesis; if it does not we may reject it

#### -acceptance region- critical region or region of rejection of null hypothesis

\***Type I error**- reject the null when it is true;  $\alpha$

\***Type II error**- not reject the null when it is false;  $\beta$

-are inversely related; decreasing 1 increases the other

-cannot minimize both at the same time, but Type I is more serious

-keep the probability of a Type I as low as possible, like .01 or .05, and minimize the probability of a Type II as much as possible

\* **$\alpha$** - probability of a Type I error; **level of significance, confidence coefficient**

\* **$\beta$** - probability of a Type II error;

\***power of the test**- probability of not committing a Type II error; the power of a test is its ability to reject a false null hypothesis :  $1 - \beta$

-operating characteristic curve shows  $\beta$  vs. mean

-classically, fix  $\alpha$  at .01 or .05 and maximize the power, that is minimize  $\beta$

\***interaction**- when the effect of X1 on y is influenced by X2

-include a  $\beta$  for interaction that includes both variables additionally

\*indicator, dummy variable- takes on a value of 0 or 1

-standard error is the precision of the estimator

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\***power function graph, power curve**- shows the probability of rejecting H with the scale of  $\mu$

\***p value, or exact level of significance**- the lowest significance level at which a null hypothesis can be rejected

-let the reader choose the significance level, just report the results

-statistical significance is not economic significance

-significant, moderately significant, highly significant

-just choose the p-value of the test-statistic

\***bootstrap**- used to estimate standard errors of the forecast

\***bootstrapping**- standardizing a measure based on prior data; past observations are sampled with replacement to get averages of future returns



## 2) Test of significance approach

- just uses a test-stat to determine significance, whereas the confidence interval approach uses a
- measures how frequently the conclusion will be wrong in the long run
- decision to reject or accept null is made based on the value of the test statistic
- the test statistic is the Z-statistic here
- page 910 -911
- \*Z test-

## Hypothesis Testing Steps

- 1) state the null hypothesis and the alternative hypothesis
  - 2) select the test statistic
  - 3) determine the probability distribution of the test statistic
  - 4) choose the level of significance  $\alpha$
  - 5) using the probability distribution of the test statistic, establish a confidence interval
- if it is within this confidence region, do not reject null
  - if it is outside this region, reject the null in favour of the alternative
  - in not rejecting or rejecting a null, you are taking a chance of being wrong  $\alpha$  of the time

-confidence interval estimates and hypothesis testing

## Determining the statistical method

- 1) purpose of the statistical inference
- \*5 objectives:
- A) describe a population
  - B) compare 2 populations
  - C) compare 2 or more populations
  - D) analyze the relationship between 2 variables
  - E) analyze the relationship among 2 or more variables
- 2) the type of data: nominal, ordinal, interval

## Additions

- 1) **Wilson estimator**- uses when there is no chance of finding a success in the population
- page 388 Keller

## CHECKS

### 1) ANOVA- Variance (interval)

- used to compare 2 or more populations of interval data
- determines whether there are differences between population means
- can only compare 2 populations; only measure a difference, or greater or less than
- \***response** variable is the independent; values are called responses
- \***experimental**- dependent variable
- \***factor**- criterion by which populations are classified
- \***multi-factor experiment**- comparing populations on the basis of multiple factors
- \***level**- each population is called a factor level

**\*SST, sum of squares for treatments, between treatments variation**- test statistic; measures the proximity of sample means to each other; 0 when equal

**\*mean squares for treatment, MST**=  $SSE/k-1$

**\*SSE, sum of squares for error, within-treatments variation**- denotes how much variation exists to see if SST is significant; tells how much variation we can expect from the response variable

**\*mean square for error, MSE**=  $SSE/n-k$

**\*test statistic:**  $F = MST/MSE$

-test statistic is F distributed with  $k-1$  and  $n-k$  degrees of freedom, assuming normal

-large F indicates rejection of null; large F is large SST

$F = t^2$

**A) 1 way ANOVA**

**B) 2 way randomized block**

**C) Multi-factor ANOVA: factorial experiments**

**\*complete factorial**- the data for all possible combination levels of the factors are gathered

**\*replicate**- number of observations for each combination

**\*balanced**- number of replicates for each treatment is the same

*-a complete factorial experiment where the number of treatments is  $ab$  with  $r$  replicates per treatment*

**Taguchi Loss function**- through the goal posts

### Multiple Comparison Methods- ANOVA

**1) Bonferroni**- for just 2 or 3 out of 10

**2) Tukey**- for comparing all possible combinations

**3) Fisher's LSD**- to point to areas that should be investigated further

### Elements of a model

**1) multi-factor**

**2) randomized block design, repeated measures design**- matched groups of observations from each population: 2-way ANOVA

**3) fixed or random effects**

-deterministic (hard to do) or probabilistic (to account for unknown)

### Model Assessment

**1) standard error of estimate**

**2) coefficient of determination; adjusted for DF**

**3) F test of ANOVA**

-multicollinearity does not affect F test

-t tests of the coefficients to determine whether the independent variables are linearly related to the dependent

## Model Building

- 1) identify the dependent variable
- 2) list potential predictor variables
- 3) gather the required observations for the potential models
- 4) identify several possible models
- 5) use statistical software to estimate the models
- 6) determine whether the required conditions are satisfied
- 7) use your judgment and the statistical output to select the best model

## 2) Chi-Squared- Goodness of Fit (nominal)

### 1) Goodness of Fit

-describe a single population; nominal; 2 or more categories

1. Akaike's Information Criterion
2. Amemiya's Prediction Criteria

### 2) Contingency Table

-analyze relationships between 2 variables and compare 2 or more populations; nominal

### 3) Normality Test

## Regressions

- 1) **t-test**- the mean of group 1 = the mean of group 2
- 2) **median test**- the median of group 1 = the median of group 2
- 3) **Wilcoxon Z test**- the rank of group 1 = the rank of group 2
- 4) **sign test**- there are more positives than negatives
- 5) **paired t-test**- the mean increased over time
- 6) **regression**- X, or several variables, is significant in explaining Y
- 7) **linear regression**- Y is a continuous random variable and other conditions have been met

## Generalized linear models

-flexible generalisation of OLS

- It relates the random distribution of the measured variable of the experiment (the *distribution function*) to the systematic (non-random) portion of the experiment (the *linear predictor*) through a function called the **link function**.

### 3 elements

1. A distribution function  $f$ , from the exponential family.
2. A linear predictor  $\eta = \mathbf{X}^T \boldsymbol{\beta}$ .
3. A link function  $g$  such that  $E(\mathbf{Y}) = \boldsymbol{\mu} = g^{-1}(\eta)$ .

### 8) **logit regression**- Y is either 0 or 1

-known as logistic mode, logit model, or maximum-entropy classifier

-used to estimate the probability that a particular outcome will occur

- the dependent variable is the odds ratio, which is another way to express probability
- \***odds ratio**= probability of event/ 1 – probability of event
- $\ln(y) = \text{xxxxx}$
- takes the natural logarithm of the odds ratio
- positive coefficient means increase in independent variable leads to increase in probability of event; negative opposite

**9) probit regression**- Y is between 0 and 1

10) Cox regression

**11) stepwise regression**- iterative procedure that adds and deletes 1 variable at a time

### TIME SERIES

1) Autoregression

**2) Lattice method**

- uses a tree like probability structure to develop valuation
- starts at the end and works its way back to the beginning to get a value

**3) Regime switching (opposed to single regime models)**

- capture time series properties of several important financial variables, including interest rates and exchange rates
- as economic environments change, so do the data generating processes of related financial variables
- capture discrete shifts in the behaviour of financial variables by allowing the parameters of the underlying data-generating process to take on different values in different time periods

**Needs:** 1) number of regimes 2) time periods when regimes change 3) transition probabilities

\***generalized regime switching, GRS**- can condition transition probabilities on the history of the data under investigation

**4) Binomial options pricing model**

- can value underlying instruments over time, not at a specific point only (European options)

-so is good for Bermuda and American options

**3 steps**

1. price tree generation
2. calculation of option value at each final node
3. progressive calculation of option value at each earlier node; the value at the first node is the value of the option

5) Black-Scholes model

**6) Monte Carlo options models**

- used for real options and Asian options, which have high degrees of uncertainty

\*parametric-

**\*nonparametric-** inference, statistics, and analysis

-distribution free methods, do not rely on assumptions that data are drawn from a probability distribution

-nonparametric regression involves constructing the model from the data

-utilizes rank and order statistics

-are more robust; may be applied when less information is known; can be easier to use

**\*histogram-** is a simple non-parametric estimate of a probability distribution

**\*kernel density estimation-** provides better estimates of the density than histograms

\*kernels-

\*splines-

\*wavelets-

### **Kernel regression**

1) Nadaraya-Watson kernel regression

2) Priestly-Chao kernel estimator

3) Gasser-Muller kernel estimator

### **Nonparametric tests**

1) [Anderson-Darling test](#)

2) [Cochran's Q](#)

3) [Cohen's kappa](#)

4) [Efron-Petrosian test](#)

5) [Friedman two-way analysis of variance](#) by ranks

6) [Kendall's tau](#)

7) [Kendall's W](#)

8) [Kolmogorov-Smirnov test](#)

9) [Kruskal-Wallis one-way analysis of variance](#) by ranks

10) [Kuiper's test](#)

11) [Mann-Whitney U](#) or Wilcoxon rank sum test

12) [Maximum parsimony](#) for the development of [species relationships](#) using [computational phylogenetics](#)

13) [median test](#)

14) [Pitman's permutation test](#)

15) [Rank products](#)

16) [Siegel-Tukey test](#)

17) [Spearman's rank correlation coefficient](#)

18) [Student-Newman-Keuls \(SNK\)](#) test

19) [Van Elteren stratified Wilcoxon Rank Sum Test](#)

20) [Wald-Wolfowitz runs test](#)

21) [Wilcoxon signed-rank test](#)

-these tests have less power, a larger sampler sample size is needed to draw conclusions with same confidence

**\*order statistic**- min and max values, medians and sample quintiles

**\*rank statistic**-

**\*robustness**- robust statistical technique performs well even if its assumptions are somewhat violated by the true model from which the data were generated

**economics**- robustness defines the ability of a financial trading system to remain effective under different markets and different market conditions

**decision making**- a decision that is as immune to uncertainty as is possible and looks good to all constituents long after it is made

### **Log-rank**

-hypothesis test used to compare the survival distributions of 2 samples

-nonparametric test, appropriate when data are right censored; clinical trials

1) Mantel-Haenszel test-

2) Mantel-Cox test-

### **1) Stochastic volatility models**

-used to value derivative securities such as options

1. Heston model

2. Garch model

3. 3/2 model

4. Chen model

5. SABR

**\*volatility smile**- long-observed pattern where the at-the-money options tend to have lower implied volatilities than other options

### **Event Studies**

-involves calculating abnormal returns around and estimating beta from market model or other return generating process, generating expected returns, and calculating abnormal returns

**\*CAR**- sum of abnormal returns over some time window

-adjust test statistic for event induced variance changes (standardized cross-sectional residuals, thin trading (Scholes Williams betas)

-uses nonparametric tests: generalized sign, rank, jackknife

-good for indicating outliers

### **Time Series**

-forecasting is common among managers and government decision makers

Components

**1. long-term trend**- secular, relatively smooth pattern or direction exhibited by a series

-duration more than a year; not always linear

**2. cyclical variation**- wavelike pattern describing a long-term trend that is generally apparent over a number of years; duration of more than 1 year

-recession and inflation, product demand cycles, monetary and financial sectors

-usually ignored, persistent and consistent cycles are rare

**3. seasonal variation**- cycles that occur over short repetitive calendar periods; duration less than 1 year

- could be traditional seasons, or any systematic pattern over a month, week or day

**4. random variation**- caused by irregular and unpredictable changes in a time series not caused by other components

-masks the existence of other more predictable components

-try to reduce this variable

### Smoothing Techniques

-used to remove some of the random variation, making it easier to detect trend and seasonality

**1) moving average**- arithmetic mean of the values in that time period and those close to it;

**2) exponential smoothing**- uses a smoothing constant to account for prior periods skipped by moving average

-trend and seasonal analysis can be done to account for trend and seasonal effects

**\*deseasonalization**- removes seasonal variation in time series

-seasonally adjusted time series

### Forecasting techniques

1) Vector Autoregression

$$y = b_0 + b_1(y_{t-1}) + e$$

2) exponential smoothing

3) forecasting with seasonal indexes

) Regime switching

3) Cointegration

4) GARCH

5) ARCH

6) dynamic regression, transfer function models-

\*seasonal indexes- used to measure seasonal variation

\*markov chains-

- \*Gaussian
- \*Kalman filter

Arma model  
 BOXCOXAR  
 Newton-Raphson method  
 Gauss Newton  
 Croston's method

Arima model  
 Unobserved component models (UCM)  
 Exponential smoothing models (ESM)  
 Intermittent demand models (IDM)  
 External models (EM)

### Nonparametric Statistics

- distribution-free statistics
- applied to problems when the data are either ordinal or interval but not normal
- 1) Wilcoxon rank sum test**
- used to compare 2 populations of ordinal or interval data when the data are generated from independent samples
- 2) Sign test**
- used to compare 2 populations of ordinal data drawn from a matched pairs experiment
- 3) Wilcoxon signed rank sum test**
- used to compare 2 populations of nonnormal interval data taken from a matched pairs experiment
- 4) Kruskal-Wallis test**
- compare 2 or more populations of independently sampled ordinal or interval nonnormal data
- 5) Friedman**
- used instead of Kruskal-Wallis test when the samples are blocked
- 6) Spearman Rank correlation coefficient**
- used to determine whether 2 variables are related

### **Statistical process control- decision analysis**

- used for modelling and management techniques- UNF
- quality control
- chapter 22 stats or modelling and management textbook



## *Research Approaches*

### 1) Financial performance

#### **a. association types of studies**

-price-earnings relationship

#### **b. characterization models**

-bankruptcy prediction- financial distress characterization models

-investment product decision-between 2

-financial instrument decision- between 2

#### **c. market performance forecasts**

-using accounting information

#### **d. analysis of transaction data**

### 2) Asset pricing

#### **a. variance ratio testing**

-random walking or walking randomly

#### **b. cross-sectional CAPM**

-empirical approach to CAPM

### 3) Other

#### **a. overreaction hypothesis**

-analyzing winners and losers

#### **b. event studies**

### Random Walking or Walking Randomly

#### **-test of random walk theory, variance ratio test: daily stock returns**

-stock market efficiency

**\*information efficiency**- asset prices fully reflect all relevant available information instantaneously

-arrival of information is unpredictable, so are asset prices; randomness

-since information arrival is random, the best indicator of price is current price

$$P_t = P_{t-1} + e_t$$

$P_t$ = today's price

$P_{t-1}$ = previous period's price

$e_t$ = error term

-each random error term represent the arrival of new information, which must be independent of each other

-the variance of the error term is linear in the time frame over which prices are observed

**Lo and MacKinlay (1988)**- straightforward specification test; based on linear relationship between time interval of price observations and its variance

-they develop limiting distributions for variance ratio estimators, with and without the existence of heteroscedasticity, and showed that asset prices do not follow a random walk

### **Overreaction hypothesis**

**-winner and loser portfolios, ranking securities by past returns, long-term monthly holding period returns: monthly stock returns**

-behavioural finance research did not begin until mid 1980's

-homo economicus research dominated, not until clinical psychology and experimental economics became big

**Debondt and Thaler (1985)** – seminal study on stock market overreaction

-results showed that over long holding period horizons, stock appear to register significant price reversals

-stark contrast to the price continuation or positively autocorrelated effects exhibited over shorter time horizons- like by Lo and MacKinlay (1988)

-reversal is based in behaviour; investors tend to overweight recent performance and underweight longer-term or baseline information in their decisions

-for example, if a stock has recently suffered an earnings shortfall because of some temporary nonstructural shift in economic opportunities, the price decline may be exaggerated due to the recentness of the news; once depressed, the price may be slow to recover until investors realize their overreaction to the temporary bad news associated with the earnings deficiency, which then creates buying pressure to reverse the price decline; adjusting beliefs to realistic longer-term opportunities, instead of short-term prospects and bases of information, causes the reversal; D & T find a significant persistence to this reversal phenomenon and indicate that markets tend to suffer from investor overreaction

-overreaction hypothesis can be tested empirically; find winners and losers, and get 2 sample periods for them

**Conrad and Kaul (1993)** – introduce the idea that cumulating returns over long horizons biases results

### **Cross-sectional approach to Empirical tests**

#### **CAPM**

**-CAPM test, test for ARCH effects and autocorrelation, fama-macbeth approach: monthly stock returns**

**Sharpe(1964), Linter(1965), Black(1972)**

-defines the systematic risk of a risky asset in terms of the beta coefficient; the ratio of an asset's covariance with the market portfolio to the variance of the market portfolio

-implications of CAPM present in profitability of investment strategies, portfolio performance, and estimation of the cost of capital

$$E(R_i) = R_f + \beta_i [E(R_m) - R_f]$$

$\beta_i$  - measure of the systematic risk

$E(R_i)$  - expected return on the  $i$ th asset

$R_f$  - risk-free rate

$E(R_m)$  - expected return on the market portfolio

**\*market portfolio** - efficient portfolio containing all possible assets

-direct empirical implication of CAPM is a linear relationship between expected stock returns and the market betas, which completely explains the cross-sectional differences in expected returns; tested by the cross-sectional regression approach

-another way to test is that CAPM also implies mean-variance efficiency of the market portfolio

-cross-sectional approach can also be applied to multi-factor models and to the investigation of the so-called stock market anomalies such as E/P ratio or firm-size anomalies

## 2 stages to CAPM cross-sectional approach

1. estimates of the systematic risk (beta) are obtained by regressing each stock's returns on the market returns in time-series regressions; the market model
2. stock returns are regressed on the estimates of the market betas from market model in cross-sectional regressions

**Fama and Macbeth (1973)** - suggest a much more sophisticated approach to testing the CAPM

-they first estimate the cross-sectional regression ( $\beta_i$ ) for each month in the sample period and compute the sample mean of the estimated slope coefficients (risk premiums associated with the market beta)

-they then proceeded to test whether the average monthly slope coefficient is significantly different from 0

**Shanken (1992)** - argues that ordinary least-squares (OLS) estimators can be used because the cross-sectional estimates are not heteroscedastic

-in this approach, the market betas to be used in each monthly cross-sectional regressions are usually estimated using data from the period preceding each month and are referred to as rolling betas

Judge

## Event Studies

**-market model regression, abnormal returns, testing abnormal returns, effect of earning surprises on returns : daily stock returns, quarterly earnings, quarterly earnings announcement date**

-investigate the stock market response to public announcements of new value-relevant information

- stock returns are analyzed in a relatively short period of time, like a few days surrounding the announcement date
- more precisely announcement date can be measured, more powerful and reliable the analysis is
- stock splits, mergers, earnings announcements
- direct implication of the market efficiency hypothesis for event studies is that prices should reflect all the new information without delay when it arrives in the market

**Fama (1969)**

**Ball and Brown (1968)**

**Patell (1976)**- proposes a test statistic where the event period abnormal returns are standardized by the standard deviation of the estimation period abnormal returns; this standardization reduces the effect of stocks with large return standard deviations on the test; his test statistic assumes cross-sectional independence in abnormal returns, and it also assumes that there is no event-induced change in the variance of the event-period abnormal returns

**Boehmer(1991)**

**Chen (1986)**- uses a multifactor model instead of single-factor model

-get the announcement date, get a proxy for returns before the announcement date, and then measure the difference in returns

**Peterson (1989)**

**Henderson (1990)**

### **Association Studies: Price Earnings**

**-earnings response coefficients, cross-sectional and time-series regressions; monthly stock returns and prices, annual earnings**

- relationship between stock prices or returns and accounting earnings is usually investigated through association or event study approaches
- in association studies, returns measured over long time periods are regressed on unexpected earnings
- a short-term market response to the earnings announcement is investigated by using the event study approach
- some studies also use the price-earnings regression approach to investigate short-term market responses
- studies estimating the price-earnings regression are interested in the significance of the estimated ERC, earnings response coefficient, and the explanatory power of the model
- ERC should be statistically different from 0 if accounting earnings lead stock prices
- from an economic perspective, the ERC should be the reciprocal of firm's expected rate of return
- typical research design regresses annual stock returns (or end of year prices) on the contemporaneous year's earnings
- some studies also use returns from previous periods in the regressions, because stock prices can lead accounting earnings

**Collins and Kothari (1989)**

**Kothari (1992)**- investigates the alternative returns-earnings regression specifications under the assumption that stock prices lead accounting earnings; stock prices reflect information about future earnings that are not involved in past earnings

-reports that the inclusion of leading-period returns in the price earnings regressions reduces estimation bias in the estimated ERCs; as a result ERCs increase as leading period returns are included in the price-earnings regression

**Kothari Zimmerman (1995)**- compare the so-called price and return models

-in price models, stock prices are regressed on EPS figures; whereas in return models, stock returns are regressed on scaled earnings

-found that ERCs are substantially less biased in price models than in return models; however, heteroscedasticity and model misspecifications cause more problems for price models than for return models; so both should be used to ensure empirical results are not sensitive to the way the model is specified

**White (1980)**- heteroscedasticity test

### **Characterization models: Financial distress and bankruptcy**

**\-discriminate, univariate, logit, probit; annualized financial statement data**

-bankruptcy can result from firm not being able to make a required bond payment or from a desire from management to restructure its financial obligations

-could be many causes, but most cases are preceded by its inability to meet financial obligations

-characterizing financial distress is useful for investors, acquiring entities, credit ratings, governments

-major problem is numerous firm-specific variables

**Altman (1968)**- uses the Z-score model with liquidity, debt, and operational performance ratios in a discriminant-function framework;

**Kaya and Theodossiou (1999)**

**Theodossiou Kaya (1996)**- financial distress is a firm meeting 1 of: actual debt default; management negotiations with creditors to restructure terms of debt instruments;

difficulty in meeting the payment requirements of debt contracts

-variables measure liquidity, debt, managerial efficiency, profitability

### **Forecasts of market performance with accounting data**

#### **-grouping stocks into earnings-price and book-to-market quintiles, computing correlations; annual stock returns and financial statement variables**

- cross sectional relationship between fundamental accounting ratios and stock returns
- accounting variables, such as the book value of equity and earnings information, have long been used for financial analysis
- financial statement variables are easy to collect and implicitly represent a connection between operating performance and valuation
- numerous studies have examined the B/M and P/E ratios to stock returns
- 2 investment styles: growth (glamour) (low BM and low PE); value (high BM high PE)
- studies consistently conclude that value outperforms growth
- the connection between the accounting data driven ratios and stock performance has been linked to growth prospects of firms
- value stock ratios indicate low growth prospects, and those firms classified as growth or glamour stocks point towards high future growth prospects
  
- portfolios are created 3 months after the end of each firm's fiscal year and are held for 5 years without rebalancing
- form quintile portfolios based on the BM and PE ratios to examine the impact these fundamental financial variables have on returns

**Broussard, Michayluk, Neely (2000)**

**Basu (1977)**

**Laskonishok , Shleifer, Vishny (1994)**- the expectations for glamour firms to meet those growth forecasts are also high, so when disappointments occur, the price impact on glamour firms is especially devastating; on the other hand, growth expectations for value firms are somewhat low, so when these firms do better than expected, the appreciation in stock price is forthcoming

-hence, the investment performance advantage of value stocks over growth stocks is clear

**Haugen (1995)**

**Fama French (1992)**- indicate that although the fundamental ratios are important in analyzing the performance aspect of value v. growth firms, but indicate that the ratios may also be important for CAPM

-specifically, the BM ratio and firm size appear to be important variables that compete with CAPM frameworks; in this case it is argued that the covariance with the market portfolio alone does not fully account for priced firm risk; that is, the easily generated BM ratio may contain a measure of risk that is important to investors and priced in the market, which translates into the noted statistical significance found by Fama French

### Analysis of transaction data

#### **-effective spreads, information content of trades, vector autoregressive models; annual stock returns and financial statement variables**

-the microstructure of securities markets is a good research area

-transaction data became widely available in 1988, and then studies increased

-wide variety of issues:

1) bid-ask spreads- studies sought to justify their existence and explain their composition  
3 components:

a. order processing cost-

b. inventory cost- arise because when market makers trade, they regularly deviate from their optimal portfolio holdings; reduce ask and bid if he has too much

c. asymmetric information cost- arises because uninformed and informed traders trade in the same market; since trading is anonymous, market makers protect themselves by charging a premium (wider spread)

-no agreement on their magnitude

2) optimal design of markets

specialist/auction (NYSE) dealer (NASDAQ) and ECN

3) Trading costs for securities transactions- effective spreads could be a measure; data limits availability; for example, executed trades are available, but orders are not; and a significant part of trading costs is the time it takes to place the order, which is not available

4) price impact of a trade- easier to sell smaller lots, but the price keeps declining; hard to sell a huge lot at once

-total cost of selling also depends on how much the price declines

-one good measure of price impact of a trade is an assessment of how liquid a certain market is

**Hasbrouk (1991)**- analyzes the relation between trades and prices; uses a VAR to measure price impacts

-you have 2 data sets, quotes and trades, combine them and run a VAR

**O'Hara (1995)**- discusses underlying theories

**Madhavan (2000)**- synthesizes empirical research and relates it to the theory

Lee and Ready (1991)

## *Scholarly Journal List*

-major papers for selected topics~not comprehensive

Phillips (1958)

Cobb-Douglas

Buse (1982)

Markowitz

Sharpe (1964) CAPM, Lintner, Mossin

APT

Fama-French

CARA

HARA

CRRA

O'Hara (1995)- discusses underlying theories

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**Fama and Macbeth (1973)**- suggest a much more sophisticated approach to testing the CAPM

**Sharpe(1964), Linter(1965), Black(1972)**

**Lo and MacKinlay (1988)**- straightforward specification test; based on linear relationship between time interval of price observations and its variance

**Debondt and Thaler (1985)** – seminal study on stock market overreaction

-results showed that over long holding period horizons, stock appear to register significant price reversals

**Conrad and Kaul (1993)** – introduce the idea that cumulating returns over long horizons biases results

# **INFORMATION TECHNOLOGY**

**1. Information Technology**

- use of IT increases fraud exposure; input and output errors can increase
- paper audit trails aren't as long and don't last as long
- audit trail must include documentation and control techniques
- on the positive side, computers give quicker access to large amounts of information

**Internal Control Objectives**

1. promote effectiveness and efficiency of operations
2. maintain reliability of data
3. assure compliance with laws and regulations
4. safeguard assets

## **2. Control Framework**

-obtaining reasonable assurance relies on management and the board

***IS internal control based on 2 documents:***

### **1. COSO**

-focused on entity wide controls

-5 areas: control environment, risk assessment, control activities, information and communication, monitoring

### **2. COBIT**

-focused on IT control

-3 distinct audiences: management, users, IS auditors

### ***3d Framework***

1. Information Criteria- quality requirements, fiduciary requirements, security requirements

2. IT processes- planning and organization, acquisition and implementation, delivery and support, monitoring

3. IT resources- people, application systems, technology, facilities, data

### ***Classification of Controls***

#### **1. General Controls**

-relate to the environment

1. organization and operation of computer facilities

2. general operating procedures

3. equipment and hardware controls

4. access controls to equipment and data

#### **2. Application Controls**

-specific to individual transactions and designed to prevent, detect, and correct errors and irregularities in transactions during the input, processing, and output stages

### ***3 Categories***

#### **1. Input Controls**

-provide reasonable assurance that data has been inputted correctly

a. edit checks

-error listing, field checks, hash total, financial totals, limit and range checks, preformatting, reasonableness test, record count, self-checking digits, sequence checks, sign checks, validity checks, overflow test

b. key verification

c. redundancy check

d. echo check

e. completeness check

#### **2. Processing Controls**

-provide reasonable assurance that processing has been properly completed, as intended

a. posting check

b. cross-footing

c. zero-balance check

d. run-to-run control totals

e. internal header and trailer labels

f. concurrency controls

g. key integrity checks

### **3. Output Controls**

-data control group supervises output

-provide reasonable assurance that processing results are correct and only authorized personnel receive the output

Functional Areas of IT Operations

-IT should be separate from other departments;

-users initiate and authorize all changes; formal authorization is required

-asset custody remains with user departments

-error log maintained data control group follows up

### ***Segregation of Duties***

1. DBA- develops and maintains database; controls access

2. systems analysts- no programming or access to anything; review system and give programmers new designs

3. programmers- no access to actual programs and data; write and implement new programs

4. computer operators- no programming abilities; should rotate; most important is between them and programmers

5. data conversion operators- convert and transmit data

6. librarians- no access to equipment; maintain files

7. data control group- independent of computer operations; access codes and such

8. transaction authorization- signed forms; data control group authorizes

9. end users- access only to final output

### 3. Processing Modes

#### 5 Types

1. batch mode- consolidation
  2. remote batch processing- different locations work together
  3. inline, real-time processing- continuously updated; sequential systems don't use it
  4. timesharing system- no downtime; many departments same system
  5. service bureaus- similar to timesharing; payroll, contracted out
- processing centralized at first with dumb terminals
  - decentralized costs more, but will more closely match individual needs
  - distributed data processing makes a decision each time about best location; some remote and some centralized
  - most systems are fault tolerant, they can still operate if hurt
  - \***fail-safe**- keep operating at full capacity
  - \***fail-soft**- operate at reduced capacity; most have this
  - some outsource and some spin off new IT units
  - most use a hybrid of centralized and decentralized
  - \***application service providers ASP**- most companies; provide support via Internet

#### **4. Computer Systems**

-program language translators translate other computer programs

#### **Systems Software**

-programs that manage and support the computer system

-enables the computer to execute the application programs by: performing language translation, monitoring data communications; controlling input, output, file management and access, and data storage

-OS is the first program downloaded to the computer; acts as the interface between the hardware, software applications, and users; DOS, Windows, UNIX, Linux/Red Hat, OS/2 IBM

#### **5 Basic Functions of an OS**

1. user interface- command driven, menu drive, graphical interface GUI
2. resource management- memory management programs
3. file management programs- creation, deletion, access, storage
4. task management programs- multitasking
5. utilities and support services- housekeeping, virus, compression, defragmentation, recovery, backup

#### **4 Things CPU Facilitates**

1. multiprogramming- manage several at a time; only 1 can be processed by CPU at a time
  2. multitasking- multiprogramming on a single user operating system
  3. multiprocessing- processing more than 1 program simultaneously on multiple CPUs
  4. virtual memory- memory function created and maintained by OS that enables access to unlimited primary and secondary memory
- uses hard disk drives for more memory; breaks them down into fixed length and variable length modules; stores not needed modules for later use

#### **Classes of Computers**

1. microcomputer systems
2. network computers NC
3. NetPCs
4. midrange computers
5. mainframe computers
6. supercomputers and mini-super computers

#### **Peripheral Devices**

-items connected to CPU for input, output, and secondary storage

#### **1. Data Entry Devices**

-6 types

##### **1. 4 data entry terminals**

1. dumb terminals- keyboards and monitors with limited processing capabilities
  2. intelligent terminals- modified networked PC's; ATM's, POS terminals
  3. windows terminals- dependent on network servers for Windows software
  4. internet terminals- dependent on Internet or intranet web servers for OS and applications
2. pointing devices- mouse, touchpad
  3. magnetic ink character recognition MICR- scanner used by banks

4. optical character recognition OCR- bar code readers
5. magnetic stripe technology- smart cards, credit cards
6. pen-based input
7. touch screens

## **2. Output Devices**

1. monitors
2. printers
3. plotters
4. voice response systems
5. multimedia output

## **3. Secondary Storage Devices**

-uses binary representation for data storage

1. primary storage- RAM
2. secondary storage- cds, floppy disks, hard disks
3. storage capacity- measured in KB, MB, BG, TB

\***direct, random access DASD**- magnetic disks; particular element of data or an instruction can be directly accessed without searching

\***sequential access**- magnetic tape; data stored 1 position after another; must go through all tape to find the data

5. RAM- main memory made up of semiconductor chips; small in size, great speed, and is shock and temperature resistant; is volatile, if power is lost, so is contents
6. CD-ROM- nonvolatile; firmware permanently burns into storage cells during manufacturing



## **5. Systems Development**

- business reengineering is building a business processing system from the ground up
- uses the systems approach- documenting everything and being careful; systems development life-cycle approach
- involves planning, analysis, design, and implementation
- includes development by a project team, and an information systems steering committee that works with the project team

### **Project Definition Steps**

1. Statement of Objectives
2. Systems Investigation and Feasibility
  - technical, economic, and operational feasibility
  - cost benefit analysis and tangible and intangible costs and benefits

### **Project Initiation Steps**

1. Systems Analysis
  - analysis, identify user and system requirements, evaluate alternatives, final report
2. Systems Design
  - detail designs, processing requirements, evaluate storage component, prepare systems design report, document everything, flowchart, program development, information systems steering committee
  - structured programming, CASE, object oriented programming, visual programming
3. Systems Implementation
  - parallel v. phased implementation; pilot v. plunge
4. Systems Evaluation
  - post implementation review

### **Prototyping as an Alternative**

- needed for DSS, expert systems, and MIS
- prototyping is an iterative process; when requirements are difficult in guess

### ***Advantages***

1. don't know in advance what user requirements are
2. try the system before expensive decisions are made
3. developed quickly

### ***Disadvantages***

1. be accepted before completion
  2. never be finished
  3. can be expensive
- documentation is an important internal control activity: system, operating, procedural, user documentation

### **Change Controls**

- steering committee is in charge of changes
- test with correct and incorrect information
- test data and code comparison with the master copy
- legal issues such as licensing issues

### **End-Use Computing**

- switch from centralized to more decentralized

### ***5 Reasons for***

1. unprecedented systems-development backlog
  2. more demanding and better educated users
  3. timely information as a corporate resource
  4. acceptance of the computer environment
  5. increasing sophistication of business analysis
- also have concerns: audit and control, risk of organizational inefficiencies, potential problems with end-user computing

### **Application Software**

#### ***1. General Purpose***

- general information processing; productivity packages
- software suites like Office; integrated packages (low-end suites); web browsers; e-mail; word processing; desktop publishing; spreadsheets; websheets; database management programs; personal information manager; groupware; bulletin board system

#### ***2. Application-Specific***

- support specific needs in various fields

  1. generalized audit software
  2. ACL- another audit software
  3. other packages for any department

### **Decision Support Software**

**\*structured decisions-** operational management level; inventory ordering; exact order number

**\*semi-structured decisions-** tactical management level; short run and medium decisions; can't be totally specified

**\*unstructured decisions-** strategic management level; CEO and such; long-term

#### ***4 Types Analytical Modelling***

1. what-if analysis
  2. sensitivity analysis
  3. goal-seeking analysis
  4. optimization analysis
- software piracy must be dealt with as well

## 6. System Security

-electronic eavesdropping can occur if not careful

-at a minimum, use a user account management, firewall, anti-virus protection

### Viruses, Trojan Horses, Worms

\***virus**- must execute itself; must replicate itself; alters the way another computer operates; requires an infected host

\***Trojan horse**- do not replicate themselves; just does something other than what the computer wants'-have to invite it to your computer; open e-mail or download it, viruses are easier to get

\***worm**- replicates itself from system to system without a host file; entire document is the worm; worms do not require the use of an infected host, viruses require spreading of an infected host

-virus needs a host file to replicate, while a worm does not; virus replicates itself, while a Trojan Horse does not

-antivirus software and virus hoaxes exist too

### Cybercrime

-NCCS investigates the CFAA

\***NCCS**- national computer crime squad; defines most serious computer crimes

\***AITP**- association of information technology professionals; defines computer crime

### Crimes

1. copyright infringement
2. denial of services DOS
3. theft of credit card numbers
4. phishing- uses e-mail to get information
5. spoofing- uses fake websites to get information

### Tools

1. port scans- locate weaknesses
- uses a Trojan Horse, then leaves a backdoor
2. sniffers- catch passwords
- intrusion detection systems IDS
- if LAN's aren't switched, then can be hacked
3. password crackers- guesses passwords
4. war dialing- dial telephone numbers for modems
5. logic bombs- when criteria are met, destroys things
6. buffer overflow- overflows it
- social engineering is scams; dumpster diving
- pay per clicks can work; insiders can do crimes too
- sniffers can have legitimate uses too

### Information Protection

1. firewall- barrier
2. proxy server- uses new gateways to the internet
3. antisniffers- switches to promiscuous code when sniffers are active; switched networks work too
4. encryption- best protection against data leaks and corruption
- can be in hardware or software; 2 methods for software

\***secret key**- every one has unique keys; difficult to use

\***public/private key**- better for firms; private and public keys; SSL and SHTTP

5. digital signature- used for public/private keys

6. domain keys- used to prevent fraudulent emails

## **7. Contingency Planning**

-need plans for backup of data and recovery of data

### ***Tools***

1. transaction logs- rollback and recovery
  2. electronic vaulting- for security
  3. grandparent-parent-child processing- retain previous files for a time
  4. uninterruptible power supply UPS- don't always work
  5. fault-tolerant systems- utilize redundancy
- consensus based protocols, watchdog processor, disk mirroring, disk shadowing, rollback processing, duplicate circuitry, redundancy check, summary processing, echo check, graceful degradation

### **Disaster Recovery**

#### ***Specifics***

1. employee responsibilities
  2. what, hardware, software, and facilities to be used
  3. priority of applications to be processed
- \***hot site**- fully operational  
\***cold site**- has ability to be functional
- also have mobile recovery centres; and everyone needs a copy at home

## 8. Data, Network, and Voice Communications

**\*telecommunications-** electronic transmission of data, sound, facsimiles, anything over a distance

-a sender who transmits message to a receiver over a channel with some sort of medium

### Data Communications

-when data is communicated special needs are present

#### 4 Components of Communications Network

1. communications devices, active devices- modems, switches, and routers
- front-end processors, controllers, multiplexors, concentrator
2. communications channels, passive devices- copper wires, fiberoptics, wireless
3. computers- terminals
4. control software- OS and web browsers

### Networks

-connects computers together; share resources

#### 7 Types

1. private network- PBX telephone system
2. public-switched network- standard telephone lines; simplest
3. value-added network- uses telephone lines; packet switching and frame system
4. LAN- peer-to-peer or client/server
5. WAN- bigger LAN
6. internet- server, client, protocol
7. VPN- virtual private network- network offices in different locations

#### 3 Bandwidths

-classifies speed of communications and capacity of telecommunications networks; determines transmission rates, or BPS; bits per second

1. narrow band- unshielded twisted pair lines; telephones, modems
2. medium band- shielded twisted pair lines; faster
3. broadband- fiber optic cables or anything fast

**\*adaptor-** connect computers to networks; needed for connection to any network

#### 3 Network Properties

-networks use standard protocols, hardware, and software

1. Architecture
- either peer-to-peer (cheaper) or client/server (centralized)
2. Protocol
- rules for networks; IPX/SPX or TCP/IP (most common)
3. Topology
- either point-to-point (2 devices) or multi-point (3 devices)

#### 6 Ways to Connect Computers

1. star network- passive, everything through the host; host brings down all
2. ring network- no host, all connected to each other; 1 fails bring down all
3. bus network- passive, long cord connects all; does not fail easily
4. Ethernet- star-bus network; uses a hub
5. token ring- star-ring
6. hub- allows connection through cabling

#### 5 Ways to Connect Networks

1. repeater- regenerates and transmits signals between segments of network
  2. router- connects several networks; LANs to a WAN
  3. bridge- connects networks of the same type
  4. gateway- connects networks of different kinds; protocol converter; LAN to internet
  5. switches- links LANs and routes packets among them
- \***circuit switching**- switch opens a circuit between sender and receiver; block at a time
- \***packet switching**- breaks message into packets; can fixed or variable length
- X.25 is the international protocol for packet switching; frame relay allows more traffic
- \***asynchronous transfer modem ATM**- uses high-capacity cell switching technology; breaks fixed cells into 53 bytes each for multimedia

### **Client/Server**

- becoming more important for business
- uses distributed data processing and cooperative processing

### **3 Interacting Components**

1. presentation component- what is seen onscreen
2. application logic component- can manipulate data on other clients
3. data management component- different databases on multiple servers; distributed database system

### **Advantages of**

1. centralized
2. scalable
3. flexible
4. interoperability
5. accessible
6. reduced telecommunications costs
7. thin-client systems

### **Disadvantages of**

1. expense
2. maintenance
3. operations completely dependent on server
4. distributed data
5. system maintenance more difficult
6. user access and security more complex
7. more user training

### **Industry Standardization**

- open systems can use published standards; greater connectivity and operability
  - closed system is specific for a company
- \***open systems interconnect OSI**- international organization for standards; good standard

\***integrated services digital network ISDN**- international standards for voice, data, and video over telephone lines

### **2 Advances**

1. conversion from analog technology to digital technology
2. conversion from copper wire based media to optic and wireless

### **Web Infrastructure**

- ARPANET was first backbone

- now, multiple backbones; computers to small ISPs, to large ISPs
- internet addresses begin as a domain address, or universal resource locator URL
- when this is types in, the computer communicates with a domain name server, which translates info into IP addresses; every computer has a unique one
- internet is used for everything now
- \***intranet**- local network inside a firm using the internet; good privacy
- uses enterprise information portal and other security features
- \***extranet**- intranet within a firm that allows access by customers and suppliers too
- uses VPN and WAN also; uses firewalls and such

## ***2 Languages***

1. hypertext markup language HTML- creates and link pages on the web
2. extensible markup language XML- released in 1998; facilitates sharing

### **Voice Communications**

- voice communication channels: telephone lines
- voice and speech recognition are important
- cell phones can be used for: SMS for texting, packet switching for internet; MMS for videos and photos
- pagers are communication devices as well



## 9. Databases

-series of related files in 1 location to eliminate redundancy

### Database Development

-first were flat files, which are sequential set of records; in delimited format, separated by commas

**\*indexed sequential files-** after flat files; had index so the whole file did not have to be rewritten

-then modern database management system were developed

-uses data definition language DDL for standardization; data is edited using database manipulation language DML; retrieved using a query language

-done with statement or command form

-3 main logical data structures are: hierarchal, network, relational

### Data Hierarchy

1. bit- binary digit
2. byte- 8 bits; single characters such as letters
3. data field- account balance
4. record- several fields
5. file- set of common records
6. database- several computer files

### Database Structure

1. tree or hierarchal- root and many subordinates; 1 to many; redundant data, can be difficult to query; many early ones used this

2. network- many to many entity relationships

3. relational- most popular and widely used; data stored in tables; eliminate redundant data; can be very complex

4. object-oriented- translate object oriented programming OOP to data storage models; allows inheritance, new objects from parents; used in CAD

5. multidimensional

### Relational Databases

-organizes data into conceptual tables

### 3 Basic Operations

1. selecting
2. joining
3. projecting- creating new tables

### Normalization

-relational databases must be normalized

-prevents corruption from insertion anomaly and deletion anomaly

**\*insertion anomaly-** in a properly normalized database, only 1 place needs data inserted

**\*deletion anomaly-** failure to remove all the data

**\*update anomaly-** not all data is correctly updated

-each file must have foreign key, with the same value as the primary or foreign key in the next, so data gets properly transferred

-distributed databases are stored in more than 1 location

-uses replication to continuously update them

-fragmenting or partitioning stores the most needed files in the appropriate locations

-deadly embrace occurs when same program needs the same information

### **Database Management System**

-not a database; is a system to create and manipulate those records

-serves as the interface between users and the database

-available for all types of computers

\***schema**- map or plan of entire database

\***subschema**- defines the data required for a specific applications and limits data available; protect against unauthorized access

-views provide read only access

-uses data definition language DDL to create or modify schema, subschema, and the else; uses statements and orders specifications; outlines format and input masks

-indexed property tells DBMS what field to use as the primary key for organization

-all of this is stored in the data dictionary, which includes metadata

### **Database Use and Maintenance**

-data manipulation language DML is used to alter the language

-query language is used to query the database

-structured query language SQL is a DML, DDL, and query language; uses GUI

-allows interaction with HTML and hypertext

-applications are independent of the data themselves; programs refer to the names of data item, not the actual data item; only the name of the data item is needed

### **Database Management**

-involves consolidating data records into databases that are accessible by several application programs; needs to be monitored and managed

-applications should be integrated

-DBMS ensure independence of the data from application programs

-also enables ad hoc requests and such easier

### ***4 Functions of DBM***

1. maintaining the common databases

2. providing the information

3. providing reporting capability

4. maintaining the security

-only database administrator can update data dictionary; data storage must be analyzed carefully

**10. Electronic Commerce**

-includes the entire business process in today's global environment

**Electronic Data Interchange EDI**

-earliest type of B2B

-data may travel over dedicated lines (P2P), or over the internet

-2 translation standards- ANSI and EDIFACT

-internet transmission may be done using: VPN or service bureaus, VAN

-EDI is good for small firms and reducing conflicts; disadvantages are money and such

-audit and control considerations include: digital signatures and continuous auditing

**Business to Business B2B**

-can be vertical or horizontal B2B

**Business to Commerce B2C**

-consumers buying directly from businesses

**Online Transaction Processing OLTP**

-ATM's, online credit card authorizations

-uses shadow day for daytime processing, and updates actual master files once per day

**Consumer to Consumer C2C**

-ebay

**Electronic Payment Processing**

-shopping carts, credit card processing, and EFT

**11. Enterprise Resource Planning**

- is a business operating system
- all the departments are concise into a single program
- uses an enterprise wide database, for data mining and integration

## CMA

### Information Management

-system is comprised of input, processing, and output (subsystems)

### Information System

-input is data and is processed to output for use by people

Resources- people, hardware, software, data, networks

Functions- input, processing, output, storage, control

#### **Controls**

- 1) Feedback
- 2) Feed-forward
- 3) Preventative

### Business Information Systems

#### **Operations Support Systems**

- 1) Transaction Support Systems- batch or real-time processing
- 2) Process Control Systems- electronic sensors to control flows
- 3) Enterprise Collaboration Systems- office automation systems; allow collaboration

#### **Management Support Systems**

- 1) MIS- provide pre-specified reports to managers; pre-programmed
  - 2) DSS- give interactive decision support to managers; passive; interactive
  - 3) EIS- provide information tailored to executives; active
- AI, SIS, EI

### Accounting Information Systems

-cross functional, produces management reports and performs transaction processing

-type of MIS system; external and internal reporting uses; financial and cost accounting information

-general ledger, business reporting, budgeting, inventory, purchasing and accounts payable, cash-receipt disbursements, payroll, order entry, production systems

**\*open systems-** have connectivity, common standards, interoperability, and use middleware

-systems design- SDLC- planning, analysis, design, and implementation

-project team development; and information systems steering committee

#### **1) project definition**

-statement of objectives-proposal

-systems investigation and feasibility- technical, economic(cost/benefit), and operational

#### **2) project initiation**

-systems analysis-information, functional, and system requirements; conceptual design of proposed system

-systems design and development-translating conceptual into physical design

-systems implementation-acquisition of resources and initial operation

-systems evaluation and maintenance-post review; learning curves

- JAD and RAD- good for quicker projects
- prototyping is an iterative process

### **Computer Hardware**

- performs input, processing, output, storage, control, communications, and data preparation
- microcomputers, network computers, midrange, mainframe, and supercomputers
- CPU composed of ALU and control unit
- \***primary storage**- ROM and RAM; memory; cache memory
- \***secondary storage**-magnetic and optical disk drives
- speed can be MIPS, MHz, or GHz

### **Peripheral Devices**

- input peripherals; turnaround document- sales invoice
- output- monitors, printers, and plotters; CRD or LCD
- storage; firmware; RAM or sequential access

### **Computer Software**

- computer programs and programming language translators
- systems software- systems that manage and support the computer system
- operating systems- 5 functions-
  - 1) user interface( command driven, menu driven, or GUI)
  - 2) resource management
  - 3) file management
  - 4) task management
  - 5) utilities and support services
- windows 95, UNIX, Linux, O/S2
- system management programs
  - 1) network management programs
- network operating systems, performance monitors, and telecommunications monitors
  - 2) database management systems (DBMS)
- database development, maintenance, interrogation, application development
- DDL, DML, and Query
- system support programs- windowing systems, performance monitor, security monitor, firmware

### **Application software**

- 1) general purpose
  - many programs never used; Office, Lotus expert; productivity packages, software suites
  - require a lot of space; work together; integrated packages
- 2) application-specific
  - Audit software; specific for clients

### **Decision support software**

- used for semi-structured (tactical) and unstructured decisions (strategic)
- ad hoc quick response systems used by end-users
- what-if, sensitivity, goal-seeking, optimization analysis

- software piracy
- basic data structures; Data hierarchy -bit, byte, data, record, file, database, key
- accessing files**
- key, logical and physical records
- linked list, sequential access, ISAM, direct access, overflow and volatility
- processing modes**
- batch mode, remote processing, real-time processing, time-share processing, service bureaus
- organizing**
- centralized v. decentralized; distributed data processing system; ASP's, fault tolerant

### Databases

- flat files were used before databases; then indexed sequential files;
- DBMS, DDL, DML, query language, statement,
- relational used now- uses tables

### **Database structure**

- 1) Hierarchal- accumulate redundant data; difficult to query; mainly used early on
  - one-to-many entity relationships
- 2) Network- still used by some
  - many-to-many entity relationships
- 3) Relational-main one used today
  - used for cross-referencing; each table has one element in common
  - organizes into conceptual tables; selects, joins, and projects
  - normalization prevents against insertion, deletion, and update anomalies
  - \*Entity relationship modelling-** used to plan and analyze database files and records
  - entity-relationship diagram; database cardinalities; one2one, one2many, many2many
  - primary becomes foreign key
- 4) Multidimensional
  - created from relational and used for data warehousing
  - used for online analytical processing (OALP)

- ODBC-Open Database Connectivity-used for accessing different databases
- distributed databases use replication and fragmentation
- \*schema-** map or plan of the entire database
- subschemas and views allow read only access to certain users; uses that will be required
- \*DDL-Data definition language-** creates or modifies the structure of the database
- input masks help ensure input accuracy
- data dictionary includes the metadata
- \*DML-Data manipulation language-** maintains a database; insert, update, and delete
- \*SQL-Structured query language-** all relational databases use this for DDL, DML, and query
- html uses SQL
- the application programs are independent from the physical arrangement of the data in a DBMS; programs refer to names of data items; formulas in a spreadsheet

- DBMS integrate, standardize, and provide security for the various applications that access it; set of programs to use the database
- 4 functions: **1)** maintain the common databases **2)** provide the information **3)** provide reporting capability **4)** maintain the security
- database administrator: design, operation, and security; dictionary

### **Data communications and telecommunications networks**

- sender to receiver over a channel consisting of a medium
- terminal, telecommunications processors and channels and control software, computers
- private, public-switched networks, value-added, LAN, WAN, internet (server, client, protocol), VPN
- bandwidth in BPS- narrow, medium, broadband
- adaptors needed to connect computers to the network

### **Network properties**

- 1)** architecture- master plans for the network; promotes flexible and efficient
  - peer2peer (no server) or client server
- 2)** protocol- take data packets from one device and send them to another device
- 3)** typology- network structures
  - point2point or multipoint
  - star is a passive network- all info goes to the CPU; main one, uses hub or network switching
  - ring is a passive network- all info flows through each computer
  - bus is a passive network- signals bounce through; communications channel, terminator
  - ethernet star-bus hub

- hardware and software is used to connect networks
- bridges (same); gateway(different); router (many); switches (LANS)
- narrow band telephones use circuit switching
- X.25 protocol governs packet switching; fixed or variable (frame relay)
- ATM, asynchronous transfer mode uses cell switching; for multimedia

### **Client server architecture**

- file servers are the heart of the system; provide security and access
- clients send requests to the main server; LAN; some tasks individual some shared, like databases on the server
- 3 components: **1)** presentation component **2)** application logic component **3)** database management component
- advantages**- centralized, scalable, flexible, accessible, interoperability
- disadvantages**- expensive, maintenance, server dependent, access and security complicated, user training needed

- open systems better than closed systems; Open Systems Interconnect (OSI)
- Integrated Services Digital Network (ISDN)
- currently moving from analog to digital and copper to fiber-optic

ARPANET- first packet switching network



- we don't use backbones anymore, now the ISP's are backbones
- domain address- Universal Resource Locator (URL)
- browser communicates with a domain name sever, which translates text domain address into a numeric IP address; every computer has a unique one

- intranets are for in company use; provide an enterprise information portal
- extranets are for out of company use as well
- VPN are more secure for between companies; may have a dedicated line
- can connect to the WAN as well

### **ERP systems**

- business operating systems, SAP AG, Oracle, PeopleSoft
- components: production planning, integrated logistics, accounting and finance, human resources, sales, distribution, and order management
- utilizes data warehousing and data mining
- improves back office functioning and cross referencing

### **CRM systems**

- another cross-functional enterprise system
- modules that track customers, leads, profitable customers, customer contacts, help desk software
- improves service, support, sales

**AI-** knowledge based systems; robotics applications; natural interface applications

#### **1) knowledge based systems/ cognitive science applications**

- human information processing, adaptive learning systems; chess playing games

**\*expert systems-** used for decision making; good for business and accounting

- complex, consistency, expert uses his advice- windows help system

- must have all possible answers and issues programmed in

- uses heuristics, solving a problem based on feedback

- knowledge base must be maintained with new info

**\*neural networks-** recognize patterns or make prediction using incomplete data

- recognizing credit card frauds, looking for financial trends; forecasting

**\*intelligent agents-** greatest growth area; office help that pops up; turbo tax; FAQ's

**\*fuzzy logic-** can be in between; not just 1 or 0, on or off

- anti-locking brakes, stopping trains slowly, temperature control

- sensors and overlapping ranges as well

- used much more in Japan and other countries; good ambiguity

**\*genetic algorithms-** natural selection, goes through many runs

- scheduling and design problems

- this and neural network can learn

#### **2) robotic applications-** manufacturing mainly

#### **3) natural interface applications-** speech recognition applications

- virtual reality

**Electronic commerce**

-involves everything

**1) EDI- earliest form of B2B commerce**

-point2point or over internet

-standard is needed between the 2 computers; ANSI for US and Canadian; EDIFACT for international

-VPN or service bureaus are used for transmission; VAN's too

-benefits and costs

-continuous auditing can be built in with imbedded audit modules

**2) B2B**

-vertical – within industry; buying and selling of manufacturing inputs

-horizontal- across industries; buying and selling of operating supplies

**3) B2C****4) OTP**

-shadow data updates tellers info at all banks; master updated 1 with batch processing

-ATM's are this too

-EFT's and shopping carts as well

**5) C2C-ebay**

**BUSINESS  
STRATEGY  
( Processes )**

**I. Management**

Business Planning  
Balanced Scorecard  
Quality  
Project Management Techniques  
Supply Chain Management  
Business Process Analysis  
Managing Resources  
Inventory Management  
Human Resource Management  
Pricing  
Organisational Management and Structures  
Leadership and Motivation  
Organisational Communication  
Behavioural Issues

**II. Marketing**

Marketing Basics  
Strategic Planning  
Strategic Marketing  
Decision Making Theory

**III. Ethics**

Morality  
Legality

# I. Management

## **1. Business Planning**

1. Forecasting
2. Collecting the Data for a Forecast
3. Other Measures
4. Inflation Adjustment in a Time Series Analysis
5. Learning Curves
6. Markov Analysis
7. Simulation Analysis and Sensitivity Analysis

## **2. Balanced Scorecard**

## **3. Quality**

1. Quality Management and Productivity
2. Total Quality Management TQM
3. Total Quality Cost
4. Measuring Quality
5. Monitoring Quality
6. Malcolm Baldrige National Quality Awards
7. The International Organization for Standards ISO
8. Benchmarking

## **4. Project Management Techniques**

1. Gantt Charts
2. Pert/CPM
3. Other Project Management Techniques

## **5. Supply Chain Management**

1. Logistics
2. Production

## **6. Business Process Analysis**

1. Tools for Analyzing Business Processes
2. Business Process Reengineering

## **7. Managing Resources**

## **8. Inventory Management**

1. Inventory Costs
2. Other Inventory Items
3. Methods of Inventory Cost Management
4. Other Inventory Systems

## **9. Human Resource Management**

1. Human Resource Planning
2. Employee Recruitment
3. Employee Selection

4. Career Development
5. Performance Evaluation
6. Organizing Jobs
7. Compensation and Benefits
8. Legal Issues Relating to Terminations
9. Centralization v. Decentralization Decision Making
- 10. Pricing**
  1. Product Life-Cycle Strategies
  2. Pricing Strategies
- 11. Organisational Management and Structures**
- 12. Leadership and Motivation**
- 13. Organisational Communication**
- 14. Behavioural Issues**

### **Business Processes**

-business processes are the systems and procedures that a company implements in order to effectively plan, operate, manage, and control the firm

1. business planning
2. forecasting
3. managing operations
4. business process analysis
5. managing resources
6. pricing

## **Business Planning**

-setting the standards and then measuring against the standards allows management to judge where it is, in reference to its goals; start with planning and planning starts with forecasting

### **1. Forecasting**

- the basis for the company's business plan; many types
- mathematical models are most commonly used

### **2. Collecting the Data for a Forecast**

- can look at historical data, patterns between 2 variables; most difficult step
- must find the cost driver; the causal factor in the cause-and-effect relationship

### ***2 forecasting methods***

#### **1A. Time Series Methods**

- reflects activity for 1 variable over a sequence of past time periods
- may have to be adjusted for inflation

#### ***4 patterns***

##### **1. trend**

- gradual shift higher or lower

##### **2. cyclical**

- recurring fluctuation lasting more than 1 year

##### **3. seasonal**

- due to seasonal influences; within-the-day seasonal component

##### **4. irregular**

- no discernable pattern

#### ***3 Time Series methods***

##### **1. Smoothing**

- smooth out the irregular trends; will not work with seasonal, cyclical, or trend components
- can use moving averages or weighted moving averages

##### ***A. Exponential smoothing***

- special type of weighted moving average

- needs 2 numbers: most recent period's actual value; most recent period's forecasted value
- takes the forecast developed for the current period and adjusts it up or down based on what actually occurred; actual value is multiplied by the weight put on it and this becomes the forecast value for the next period
- \*smoothing constant**- alpha; weight put on actual value;  $1 - \alpha$  is the amount put on the forecasted value
- value for the smoothing constant will affect the forecast; if 1, forecast value has no effect; if 0, the actual value has no effect; somewhere around .4
- more weight is given to the earliest period's results; this heavy weighting decreases by period until the greatest weight is on the current period
- 1 main advantage is that it is inexpensive and requires little data; but its forecasts will lag behind as trends become apparent
- the MSE is the measure of the error in the exponential smoothing, and it should be minimized
- as alpha increases, forecasting error decreases, but not past .4
- but if the actual values fluctuate greatly, we need a smaller alpha
- smoothing methods only work for a stable time series

## **2. Trend Projection/ regression analysis**

### **2 assumptions**

1. linear relationship
  2. dependent determined by the independent variables
- minimize the differences; OLS
  - first determine the coefficient of correlation; if close to -1 or +1, the regression analysis will be helpful; if close to 0, may not work
  - upward sloping trend has a positive correlation coefficient
  - downward sloping trend has a negative correlation coefficient

## **3. Trend Projection adjusted for seasonal influence**

- must adjust for seasonal influence

### **2A. Causal forecasting methods; regression analysis**

- can use time series or historical data
- a linear relationship does not imply causation
- correlation does not imply causation as well; there must still be a logical cause and effect relationship
- if the coefficient of determination is low, it may mean we are using the wrong independent variables in the regression

### **Limitations**

1. only good for the range
  2. need historical data; still may not be any good
  3. must choose correct independent variables
- usually is the only way to forecast

## **3. Other Measures**

### **1. standard error of the estimates SE**

- represents a confidence range that gives us a range around the forecasted value within which we can be approximately 67% confident that the actual value of the unknown



variable will fall; size of the standard error of the estimate must be interpreted in relationship to the average size of the dependent variable; if the SE is around 5-10% or less of the average size of the dependent variable, we can say the regression is precise  
**2. coefficient of determination**- the square of the coefficient of correlation;  $R^2$ ; % of total amount of change in the dependent variable that can be explained by changes in the independent variable; high data points are close to the trend line; low data points are scattered; above .5 ok

#### 4. Inflation Adjustment in a Time Series Analysis

\***nominal**- measured in current dollars

\***real**- inflation adjusted; = nominal / 1 + inflation rate; nominal / price index

\***price index**- need to use price index with nominal to get real

-so we use the base year for comparison purposes

#### 5. Learning Curves

-more experience gained, better you get; fewer costs

##### 1. Cumulative Average-Time Learning Model

-evaluates the time per unit required to produce a given number of units

-always between 50% and 100%

-uses a constant % of decline in average time per unit each time the cumulative quantity of units produced doubles

-at 80% 10 hours \* 2 = 8 hours each

##### 2. Incremental Unit-Time Learning Model

-evaluates the time needed to produce the last unit in a quantity of units

-declines by a constant % each time the cumulative quantity of units produced doubles

-at 80% 10 hours \* 2 = 10 hours + 8 hours = 9 hours each

##### **Benefits**

1. make or buy decisions
2. life-cycle costing
3. cost-volume-profit analysis
4. development of standard costs
5. capital budgeting
6. development of production plans and labour requirements
7. management control

##### **Limitations**

1. only for labour intensive operations involving repetitive tasks
2. learning rate is assumed to be constant
3. an observed change in productivity might actually be associated with factors other than learning

#### 6. Markov Analysis

-used to study systems and changes that take place in the systems during repeated trials

-does not try to optimize the system, just predict future behaviour

-only uses the current period to predict future periods; Markov chains with stationary transition probabilities; memory less property

-market shares for competitors, machine break downs, patient movement in hospitals, subscription duration, estimate uncollectible accounts receivable

### **7. Simulation Analysis and Sensitivity Analysis**

-the process of learning about a real situation or system by experimenting with a model that represents the real situation or system

#### **2 inputs**

##### **1. controllable inputs**

-selected by the decision maker

##### **2. probabilistic inputs**

-subject to uncertainty and described by probability distributions

-used in new product development or inventory policy

-more sensitive the result is to removing or adding a variable is the measure of the risk

-sensitivity analysis and linear programming allow us to determine ranges for the objective coefficients

\***dual price**- amount of improvement in the value of the optimal solution for each unit increase in the right-hand side of a constraint

\***shadow price**- the increase or decrease in income that would result if there were 1 more or fewer unit of a resource available

## Balanced Scorecard

- integrates non-financial measures into the overall analysis
- no 1 measure can effectively evaluate the business operations

### *Categories*

1. financial performance
2. customer satisfaction
3. internal business processes
4. innovation and learning

-employee capabilities, information system capabilities, motivation and empowerment of employees

### *Limitations*

1. each unit has its own scorecard, so evaluations across the firm are difficult
2. need extensive enterprise resource planning to capture detailed information
3. non-financial data can be unreliable

## Quality

-once budgets have been set and implemented, management needs to have the ability to control and strengthen its operations

### **1. Quality Management and Productivity**

*-productivity increases as quality does*

1. reduction in the number of defective units
2. more efficient manufacturing process
3. commitment to doing it right the first time

### **2. Total Quality Management TQM**

-get it correct the first time; catch errors as they happen

-the root is what quality really is; different things to different people

*Core Principles TQM systems*

1. support and active involvement of upper management
2. clear and measurable objectives
3. recognize quality achievements in a timely manner
4. continuously provide TQM training
5. strive for continuous improvement; kaizen
6. focus on satisfying customer's expectations and requirements
7. involve all employees

-TQM is: an organizational action; continuous training and education; people within the organization are also the customers; quality control circles; every person in the organization is responsible

### **3. Total Quality Cost**

*Cost of Conformance*

#### **1. prevention costs**

-prevent the defect from occurring in the first place: quality training and planning; equipment maintenance; supplier training and confirmation; information systems

#### **2. appraisal costs**

-to determine if an individual unit is defective: testing and inspection; quality audits; internal quality programs

*Cost of Nonconformance*

#### **1. internal failure**

-detect the problem before shipment: rework; scrap; tooling and downtime; expediting costs

#### **2. external failure**

-when the defect reaches the customer: warranty; product liability; loss of goodwill; environmental costs

### **4. Measuring Quality**

**1. quality cost indices**- total quality costs/ direct labour costs (some other measure)

**2. manufacturing cycle efficiency**- value-adding production time/ manufacturing cycle time

-or calculate ratios of good to total and so on

-need to have the shortest product development time and shortest response times

***Customer Response Time; Cycle Time***

1. order receipt time
2. manufacturing cycle time
3. order delivery time

**5. Monitoring Quality**

**1. control charts**

-measures statistical control and relativity

**2. histograms**

-bar graph

**3. Pareto diagrams**

-20% causes 80% of the problems

**4. cause-and-effect diagrams**

-Ishikawa: 4 m's: machines, materials, methods, manpower

**6. Malcolm Baldrige National Quality Awards**

-US Congress awards these, only when earned, for: manufacturing, small and service businesses

***Areas for evaluation***

1. senior executive leadership and dedication to quality
2. measurement of quality
3. strategic quality planning
4. HR development and management
5. management process quality
6. customer satisfaction- most important

**7. The International Organization for Standards ISO**

-ISO 9000; does not have to comply

-610,000 firms in 160 countries currently

-not to ensure the quality of a single product, but the entire product line

1. ISO 9000- fundamental quality concepts
2. ISO 9001- design and development, production, installation and servicing
3. ISO 9002- prevention, detection, and correction in industries where designs are supplied by the customers
4. ISO 9003- final inspection and testing
5. ISO 9004- develop and implement an internal quality control system
6. ISO 10011- auditing quality systems guidelines
7. ISO 10012- quality assurance requirements for measurement processes

-ISO 14000 is the environmental guidelines

-need an external auditor to sign off; need an internal audit system; not law

**8. Benchmarking**

-emulate best practices of others around the world to gain a competitive advantage

-does not need to be in the same industry

-first identify critical success factors and the processes that need benchmarking; then set up a diverse team to do it

-can benchmark establishing costs as well; even if not attainable, can use them as goals

## Project Management Techniques

- concerns the scheduling of large-scale projects
- many activities are involved; some more critical than others
- can make the difference between on time, and on budget

### 1. Gantt Charts

- divides the project into tasks or activities
- colour coded; easy to read
- do not show interconnection between different steps; do not show critical path

### 2. PERT/CPM

- PERT developed by Navy and CPM by DuPont
- is a probabilistic or stochastic technique, not deterministic
- the critical activities determine the whole project, so focus on these
- nodes are connected by arcs to depict the project network
- critical path is where if activities are delayed, the entire project is delayed
- those with slack time represent unused resources that can be diverted to the critical path
- we need earliest and latest start times for finish and start times
- 3 estimates are needed: pessimistic, optimistic, and most probable time
- \***expected completion time**-  $[\text{pessimistic time} + (\text{most likely} * 4) + \text{optimistic}] / 6$
- \***standard deviation**-  $\text{pessimistic time} - \text{optimistic time} / 6$
- variance is the square of the standard deviation
- activities can be crashed if the cost/time tradeoff is worth it

#### *Benefits*

1. forces managers to plan in intricate detail
2. can be used for scheduling
3. can be used to assign existing resources to a project in the most effective manner
4. can be used to calculate costs to shorten the time required for a project

#### *Limitations*

1. extremely complicated
2. can lead to overly optimistic estimates
3. assumes a bell-shaped probability distribution is appropriate
4. considers the various activities to be independent
5. can result in a degrading of the requirements and poor quality of work

### 3. Other Project Management Techniques

1. goals and objectives- must always set these first
2. budgeting- quantitative control tool; management by exception (deviations)
3. bar charts- Paretos, histograms, and Ishikawas
4. queuing theory- reduce the time waiting in lines

## Supply Chain Management

-the network of organizations, people, procedures, and systems involved in getting products to customers; JIT and MRP

### **1. Logistics**

-the flow of goods and storage of product

-Strategic Teaming Agreements can help; where you work with the supplier's supplier to gain better efficiencies

### **3 Key Elements**

1. transportation
2. warehousing
3. inventory- JIT

### **2. Production**

-the decision of what products to produce at what facilities

### ***Efficient Production Concepts***

1. materials requirement planning MRP
2. computer integrated manufacturing CIM
3. computer-aided design CAD
4. flexible manufacturing systems FMS- automated
5. robots; computer-aided manufacturing CAM

## Business Process Analysis

-analyzes the firm's operational plans and business strategies so improvements can be made; workflow analysis, TOC, variance analysis, value chain analysis

### ***BPA Elements***

1. focus on institution's core processes
2. involve knowledgeable individuals
3. document current processes via a flow diagram
4. identify bottlenecks, inefficiencies, and areas for improvement
5. determine changes required to business processes
6. plan for migration to the revised business process

### **1. Tools for Analyzing Business Processes**

#### **1. Workflow Analysis**

-break down processes into their component parts so they can be mapped and evaluated; similar to PERT

-understand the current process as best as possible first

#### **2. Theory of Constraints TOC**

-increase throughput contribution while decreasing investments and operating costs

### ***3 Measurements***

1. throughput contribution; revenues minus the COGS
2. investments
3. operating costs

### ***Steps***

1. the bottleneck operation determines the throughput contribution of the system as a whole
2. calculate the best use of the bottleneck to maximize contribution; throughput margin per minute

**\*throughput margin**- product price less variable materials costs

3. maximize flow through the bottleneck with the drum-buffer-rope approach DBR
  - the drum is the constrained process; the rope is the processes prior to the constraint; and the buffer is the minimum WIP waiting for completion by the constrained processes
4. increase production capabilities of the bottleneck by adding capacity
5. analyze the system for improvements

### **3. Variance Analysis**

-compare actual expenses to budgeted amounts

-determine standard costs from predetermined amounts

-a standard cost system can be used with a job-order costing system or a process costing system; standard costs are best used with a flexible budgeting system to provide the most useful variance analysis

### **4. Value Chain Analysis**

-identifies primary as well as support activities

-can identify what does or doesn't increase value of the product

### ***Steps***



1. identify the activities that bring value
2. identify the cost driver
3. build competitive advantage

## **2. Business Process Reengineering**

-completely redesign the process

### *Steps*

1. identify distinctive competencies; what it does best
2. examine the processes; the firm is a series of processes
3. focus on processes, not functions; horizontal processes; cut out middle management, make it more flat

## Managing Resources

-get a competitive advantage by better managing and utilizing assets, including inventory, HR, and financial assets

## Inventory Management

-concerns the effective and efficient acquisition, storage, use, and distribution of inventory

### 1. Inventory Costs

-economic trade-off between ordering and carrying costs

#### 1. Ordering Costs

-cost of placing an order; cost of receiving an order; setup costs; discounts lost by not ordering enough units

#### 2. Carrying Costs

-storage; insuring and securing inventory; inventory taxes; depreciation or rent of facilities; obsolescence and spoilage; opportunity costs of inventory investment

#### 3. Stockout Costs

-cash and profit lost and customer goodwill lost from not getting the product

### 2. Other Inventory Items

\***lead time**- time must wait to receive next order; longer lead time greater the risk of stockouts

\***safety stock**- carrying to prevent stockouts

#### 2 Effects of Safety Stock

1. variability of the lead time
2. variability of the demand for the product

\***reorder point**- level of remaining inventory until reorder

=expected demand during the lead time + amount of safety stock

\***average inventory**- safety stock + number of units ordered each time/ 2

-each unit of safety stock held will increase average inventory by 1 unit

### 3. Methods of Inventory Cost Management

#### 1. Economic Order Quantity EOQ

##### Assumptions

1. annual demand for the item is known and constant
2. cost per order is known and constant
3. unit carrying costs are known and constant
4. no stockout costs

$$EOQ = \sqrt{2aD/k}$$

-where: a= variable cost of placing an order; D= periodic demand; k=carrying cost per unit per period

#### 2. JIT

-modern systems have migrated to JIT; is a pull rather than a push system

-utilizes lean production, manufacturing cells; and each worker knows everything

-must keep very good relationships with their suppliers

#### 3. Kanban

-cards or tickets are used to keep track of inventory and movement; part of JIT

#### 4. Other Inventory Systems

1. Computer Integrated Manufacturing CIM

2. Computer Aided Design and Manufacturing CAD/CAM
  3. Materials Requirement Planning MRP
  4. Manufacturing Resource Planning MRP-II
  5. Enterprise Resource Planning ERP
  6. ABC System
- Group A- 10% inventory, high dollar items; Group B- 20% inventory, medium value items; Group C- 70% low value items

# Human Resource Management

-proper staffing is necessary

## 1. Human Resource Planning

### *Involves*

1. forecasting future HR requirements
2. progression charts for current employees
3. inventorying skills of employees
4. matching individual's with firm's needs
5. developing plans to help firm meet the needs

## 2. Employee Recruitment

### *Inside*

1. job posting
2. review of database

### *Outside*

1. advertising
2. employment agencies
3. referrals from current employees
4. other organizations
5. other

-both have advantages

## 3. Employee Selection

-match the individual with the correct job

### 1. Job Analysis

-do a **job analysis**: observation, asking, questionnaires, interviewing incumbents

-gather a **job description** to identify characteristics of the job; gather **job specifications** to identify characteristics of the successful job incumbent; these guide the selection process

### 2. Selection Devices

-interviews, written tests, performance-simulation tests, work sampling tests; assessment centres

### 3. Other Means of Staffing

-flexible staffing, temporary employees, professional employer organizations (serves as the actual employer of record)

### 4. New Employee Orientation

-receive all the requisite information

### 5. Employee Training

-initial and ongoing training

-can be formal/informal and on/off the job

-majority is informal with other employees helping

-larger firms will have more diverse training facilities

## 4. Career Development

-employee development is not undertaken to provide lifetime employment at the company or regular promotions to employees in this company

### ***Avenues***

1. communicate firm's long term goals and strategies
2. create growth opportunities with challenging experiences
3. offer tuition reimbursement
4. provide time of for learning experiences

### **5. Performance Evaluation**

-important part of manager's job; gives opportunity for growth; must notify employee  
-provide feedback and direction

\***expectancy theory**- employees want to be rewarded for good work; need clear objectives however

### ***Criteria Used***

-needs to be task outcomes, not means; employees will put effort into what they are being evaluated on

1. behaviour-oriented
2. trait-oriented
3. goal-oriented
4. employee-oriented

### ***Who Should Do it?***

-supervisors, peers, self evaluations, subordinates, 360 degree (5-10 people)

### ***Evaluation Problems***

1. halo effect- evaluates on 1 characteristic
2. central tendency error- rates all employees the same
3. recency effect
4. differing standards
5. rater bias
6. contrast error- compares to other employees
7. forced normal distribution; grades on a bell curve

### **6. Organizing Jobs**

1. job design- way the organization defines jobs
  2. job specialization- more specialized jobs can increase productivity
  3. job rotation- limits dissatisfaction
  4. job enlargement- expanding responsibilities horizontally
  5. job enrichment- hygiene factors (negatives) motivation factors (positives)
- Herzberg's theory did not include age and focused on a narrow segment; accountants and engineers

### **7. Compensation and Benefits**

-compensation must be in line with market rates, so employees feel good

- 1. base pay**-can be tied to performance evaluation
- 2. incentive pay**- individual or group performance; stock plans, piecework programs, gain-sharing programs, bonuses, pensions
- 3. benefits**- vacations, sick days, unemployment compensation, employer contributions  
-employees must realize how much their entire compensation is actually worth
- 4. flexible benefits (cafeteria plans)** - can decide based on age or necessity
- 5. perquisites (perks)** - usually top managers; cars, jets; add to status and feelings

**6. awards-** employee of the month, special parking space, quality of work

**7. expatriate compensation-** when transferred overseas

**8. Legal Issues Relating to Terminations**

-must safeguard against a wrongful termination lawsuit

**1. document everything-** minutes, conferences

**2. maintain confidentiality-** don't discuss with those who do not need to know

**3. schedule a short meeting-** refer to exact instances why he is leaving; avoid personal or vague statements

**4. allow low-visibility time to remove belongings;** checklist for company property

**5. discuss any assistance-** severance pay, escort employee of the premises

**6. document results of the meeting-** any questions asked

**7. consider irrational responses-** terminate security codes

-if due to downsizing, leave open the door to return; sometimes temp workers are even worse

-WARN requires 60 days for mass layoffs and closures

**9. Centralization v. Decentralization Decision Making**

-formalized decentralization can be good

-both have benefits and negatives

## Pricing

-proper pricing is critical to success and the product life cycle

### 1. Product Life-Cycle Strategies

1. **introduction stage**- sales grow slowly and profit is little; large investment costs
2. **growth stage**- dramatic increase in sales; competition appears; maintain prices
3. **maturity stage**- levelling off of sales; maintain market share while maximizing profit; defend market share, which may mean lowering prices
4. **decline stage**- sales and profits decline; environmental changes can dictate this; either discontinue, harvest, or maintain the product; most difficult stage to address

### 2. Pricing Strategies

#### 6 Steps

1. identify pricing constraints and objectives
2. estimate demand and revenue
3. determine cost, volume, profit relationship
4. analyze competitors: prices, costs, and offers
5. determine pricing method
6. decide on final price

#### 1. New product pricing

\***market penetration pricing**- set the lowest price

\***market skimming pricing**- new technology set high price to skim the market

#### 2. Perceived-value pricing

-based on the perceived value to the customer

\***value-based pricing, value pricing**- low or moderate price for a high quality product; large companies

\***buyer-based pricing, prestige pricing**- charge higher price based on perceived benefit; expensive cup of coffee

#### 3. Cost-based pricing

-emphasizes the supply or cost side and the demand side

\***cost plus % of cost**- 10% fee on top of construction costs

\***cost plus fixed-fee**- government contracts; fixed fee plus costs

#### 4. Target profit pricing

-calculates backwards from a profit number

#### 5. Competition-based pricing

-determined by whether they are homogenous or heterogeneous products when the competitor makes a change; 1) going rate, 2) below rate, 3) above rate

#### 6. Product mix pricing strategies

-more difficult with a mix of products

1. **product-line pricing**- price steps for different product lines; 4 classes

2. **optional-product (feature) pricing**- which features are standard are which are optional

3. **captive-product pricing**- low cost razor that needs replacement blades



**4. by-product pricing-** from petroleum, accept any price that reimburses for storage and delivery costs

**5. product-bundling pricing-** may lessen or unbundled; training or delivery with

**7. Price adjustment strategies**

**1. discounts-** quantity, seasonal, and cash

**2. allowances-** trade-in and promotional

**3. segmented pricing-** lower for seniors

**4. promotional pricing-** cash rebates, financing with low interest; get you in

**5. geographical adjustments-** quoting prices that include transportation; FOB (buyer pays at loading) and uniform (seller pays all transportation costs, retains title until delivery)

**8. International pricing**

-uniform global prices are not reasonable

**3 choices**

1. set market-based price for each country

2. set uniform price for every country the product is sold

3. set a cost-based price for each country

-price escalation, dumping, transfer pricing, grey markets, internet

**9. Public policy**

1. packaging and labelling

2. excessive cost in packaging

3. pollution

4. scarce resources

5. laws and regulations must be abided by

-advertising and sales representatives must be cautious as well]

**10. Specific price decisions and public policy**

-must avoid price fixing unless government allows it

**1. price discrimination-** different prices for big guys

**2. resale price maintenance-** making the retailer charge a certain price

**3. minimum pricing-** can't sell below cost to destroy competitors

**4. price increases-** can't increase in times of price controls, but all other times can

**5. deceptive pricing-** for example with cars

## CMA

IV.

### Forecasting

-cyclical, trend, seasonal, irregular

#### **1) smoothing**

-no significant trend, seasonal, or cyclical attributes

-moving and weighted moving averages

\***exponential smoothing**- type of moving average; the most recent actual and forecasted

-alpha between 0 and .4;

- $F_t = aY + (1-a)F$

2) trend analysis- the relationship is determined by 1 one variable; and it is linear

\***coefficient of correlation**- +1 means it is positive and upsloping; -1 means it is negative and down sloping

-size of standard error, coefficient of determination, MSE

-real rate=  $(1 + \text{nom} / 1 + \text{infl}) - 1$

-real rate=  $\text{nom} / (\text{CPI} / \text{Previous CPI})$

\***causal forecasting**- used when time series data is not available

-t value measures reliability; above 2 is good

### Learning Curves

\***cumulative average**- get total cost and hours

\***incremental unit**- last unit

### Probability

-conditional and joint

\***classical method**- each has an equal chance

\***relative frequency method**- objective method, uses factual data

\***subjective method**- combination method

-discrete(6) and continuous(6.7) random variables

-variance and standard deviation tell about variability

-coefficient of variation=  $\text{std. deviation} / \text{expected return}$

\***perfect information**- each one time the probability added together

### Linear Programming

-used to either maximize or minimize some function(objective function)

\***structural constraint**- resource limitations

\***non-negativity**- only positive numbers

-slack variable

\***shadow price**- increase in income if 1 more unit is made available

## **Project Scheduling**

### **\*PERT**, Program Evaluation and Review Technique

-uncertain estimates

-probabilistic

### **\*CPM**, Critical Path Method

-deterministic

-critical paths- longest path to finish

-slack time- number of days an activity can be delayed without forcing a delay of the entire project

-uncertainty= (pessimistic time + (most likely time \* 4) + optimistic time)/ 6

-network planning- 3 estimates for each, probabilistic or stochastic technique- contrast to deterministic technique

**\*standard deviation** = pessimistic time – optimistic time/ 6

-standard deviation of project time= individuals squared then added then square rooted

-high variance means lot of variability

**\*crashing**- reducing the critical path

-optimistic and conservative approach

**\*queuing theory**- determining the most effective and efficient way to move people and goods through a line, keeping costs to a minimum

**\*Markov analysis**- the probability that something will happen tomorrow, or again after another event

**-memoryless property**- current state of the system plus transition probabilities are the only information needed to predict future occurrences

-estimating uncollectible accounts receivable, moving patients in hospital, machine breakdown, subscription duration, market shares

-simulation- controllable and probabilistic inputs

-what if and Monte Carlo simulation- thousands of trials

## Organization Management and Structures

### 1) task specialization, division of labour

-Henry Ford developed; can be bad when people become too specialized

### 2) departmentalization

-by function, product or service, geographic territory, specialized process, or type of customer

### 3) span of control

-more people spanned over the more efficient, but can become worse as it gets too large

### 4) chain of command

-delegated authority; unity of command preserves the chain of command

#### a. matrix organization

-multiple supervisors: 1 for the product and 1 for the function

-usually just for pressure situations; problems because of dual reporting

#### b. responsibility and authority

-authority can be delegated, responsibility cannot; must have authority to complete responsibilities

### 5) centralization v. decentralization

-quicker with more input

-formalized decentralization

### Historical management theories

#### 1) **classical organization theory**- study of how people can be organized effectively

**a. Weber**- favoured bureaucratic: strict hierarchy, explicit divisions of labour and lines of authority are established

-very formalized, not adaptive, not in tune with human emotional; run by professional managers and not owners; merit system, all for the company motto

**b. Fayol**- 5 essential functions of management: 1) planning 2) organizing 3) commanding

4) coordinating 5) controlling

-divided business operations into: technical, financing, accounting, commercial, security, managerial

-developed unity of command and unity of direction

**2) school of management**- scientific management on the efficiency of individual workers; Frederick Taylor in steel foreman

1) analyze the job 2) workers selected scientifically, then trained and developed 3)

managers cooperate with workers 4) managers and workers do appropriate work

-one best way to do a job, workers need to be untaught; need proper incentives

-led to job specialization and Henry Ford

### Contemporary organizational design

1) **reengineering**- start from a blank page, starting over and restructuring

**a.** identify distinctive competencies **b.** dissect series of processes **c.** focus on processes, not functions, horizontal processes

**2) strategic partnering and virtual organizations-** alliances and use of technology; uses outsourcing

**3) outsourcing-** trend increasing among public companies

**4) lean thinking-** identify bottlenecks, JIT

### **Power and authority in organizations**

-dependency is important factor

**\*types of power:** legitimate, reward, coercive, expert, referent, charismatic

-legitimate, reward, and coercive- position power or formal authority

**\*line authority-** make decisions relevant to the primary purpose; bank officer making loans

**\*staff authority-** aides line authority; controller giving loan officer information

-referent, charismatic, and expert- personal and informal power

**\*functional authority-** expert power has formal authority

### **1) line and staff conflicts**

-staff are more advisory; line is decision-making

-expectations must be clearly defined and communicated; lines must be drawn; courtesy

-staff needs recognition and feedback; line needs support and enthusiastic participation

-organizational culture; shared responsibility from common goals and clear understanding

### **Organizational change**

-6 forces for change: **1)** people and the changing nature of workforce; diverse and older

**2)** technology and communications **3)** economic shocks **4)** world politics **5)** competition

**6)** social trends

**1) resistance to change-**change agents; can be good or bad

**a.** individual resistance to change

-habit, security, economic factors, fear of the unknown social factors, selective attention

**b.** group or organizational resistance to change

-structural inertia, over-determination, group inertia, too narrow a focus, threat to expertise, threats to power and resource allocation

### **2) managing organizational change**

-usually comes from the outside, because change means managers are not doing their jobs

-involves: communication, support of top management, participation, start small, international issues, reward employees

### **Organizing jobs and teams**

**\*job design-** the way an organization structures and defines jobs

-Taylor's scientific management advocated job specialization, led to: job rotation and enlargement

-Herzberg's job enrichment 2-Factor theory, led to: hygiene factors and motivation factors

### **1) Teams and groups in the workplace**

-work group; team is different than group; teams have benefits and costs

**2) Types of teams**

-formal and informal

-quality circles, problem-solving, cross functional, self-managed, management, product development, virtual

**3) Issues in the team model**

-leadership, abilities of members, team performance, top management support

## Leadership and Motivation

### Need based motivational theories

-level of motivation is determined by satisfying needs

#### **1) Maslow's hierarchy of needs**

-one of the earliest and best known; 5 needs, must fulfil one before moving on

1) physiological needs 2) security and safety needs 3) social needs 4) self esteem 5) self actualization

-not as accepted anymore, cultural and social differences

#### **2) McClelland's theory of needs: achievement, power, affiliation**

-3 factors

#### **3) ERG theory**

-Clayton Aldefer: 1) existence- security and physiological 2) relatedness, external esteem and social 3) growth, internal esteem and actualization

-says you can work on more than one at once and in any order; better accepted today than Maslow's

### Process-based motivational theories

-help explain why employees act how they do to better gauge compensation plans

#### **1) equity theory**

-perception of fairness of rewards; will work up or down accordingly; relevant and absolute rewards

#### **2) expectancy theory**

-Vroom developed; will work according to how much they want something and how likely they think they will get it

#### **3) goal-setting theory**

-employees need specific and goals and feedback on those goals

-commitment, belief, achievable, and country and culture

#### **4) reinforcement theory**

-positive and negative reinforcements, extinction, and punishment

#### **5) intrinsic motivation and "flow"**

-feel good once it is done; being in the flow

-meaningful work and deeply care about it

### Other motivational theories

#### **1) Theory X and theory Y**

-McGregor says managers are either X or Y based on how they deal with employees; X is negative view of humanity and associated with Maslow's lower needs; Y is positive view and with Maslow's higher needs

-could still overlap sometimes

#### **2) Theory Z**

-Ouchi said type Z is Japanese and compared to US firms; Japanese were better

## **Leadership**

### **1) Leadership v. management**

- a manager can be leader, but not all managers are leaders
- manager develops plans and brings order
- leader has a vision and brings change

### **2) Studies on leadership**

#### *a. trait approach*

- culture sex give different traits
- ambition, motivation, honesty, self-confidence, intelligence, charisma

#### *b. behavioural approach*

- Lewin developed the 3 basic leadership styles: autocratic, democratic, laissez faire
- Michigan study said task-or-job centered or employee centered

### **3) Contingency theories of leadership**

- leadership style varies on situation; transactional leaders, motivate through clarifying roles

### **4) Fiedler's LPC theory of leadership**

- contingency model; least preferred-coworker
- relationship-oriented and task-oriented leaders are needed for different situations

### **5) Path-goal theory of leadership**

- Evans and House, current approach
- leadership style depends on situation: directive, supportive, participative, achievement oriented
- personal characteristics of subordinate and of the environment affect leader's moves

### **6) Vroom's decision tree approach**

- 2 trees: 1 for quick decisions and 1 for developing others abilities

### **7) Transformation leadership**

- not opposite of transactional leader, just extended further; better than transactional
- gets more effort at a higher level; charisma, inspiration, intellectual stimulation, individualized consideration

### **8) Management by objectives (MBO)**

- Drucker introduced; employees work harder when they have goals and objectives
- bottom up and top down goals cascade setting
- specific goals, participative decision making, explicit time period, continuous feedback
- goals must be achievable
- only area it deviates from goal-setting theory is participative goal setting
- needs: realistic expectations, commitment by top management, and allocation of rewards based on performance



## Organisation Communication

-social process where 2 or more people share information; needs response from receiver

### 1) The communication process

-source, encoding, transmission, medium, decoding, receiver, feedback, noise

### 2) Interpersonal communication

-oral, written, or nonverbal

### 3) Channels of communication in organizations

-organizational channels can be formal, informal, or computers

-over time, communication networks develop into a sophisticated social system

-upward, downward, or horizontal

#### *a. formal small-group networks*

-formal structure of the company; 5 basic patterns

-wheel channel, circle, Y, and all-channel networks

#### *b. informal small-group networks*

-outside the formal, the grapevine; all-channel network; management does not control, 75% of info is correct, self-serving interests, rumours

#### *c. roles in communication networks*

-gatekeeper, liaison (bridge), cosmopolite (opinion leader), and isolate, isolate dyad

### 4) Barriers to effective communication

-filtering, selective perception, information overload, language, jargon, communication apprehension, status and gender barriers, poor channel selection, noise

-*to solve these problems*: reduce noise, encourage informal communication, balance information load with information processing capability, feedback

## Behavioural issues

### Goal congruence

- balance between congruent goals and decentralization of management authority
- goals set by department need to be aligned with the company's goals
- using the proper measurement tools, budgets and ratios, can achieve this

#### 1) Agency theory

- agency problems are between shareholders and management
- principles hiring agents
- shareholders and creditors as well; risk v. default
- arises from moral hazard and adverse selection
- can be controlled by monitoring and incentives

#### 2) Authority and responsibility

- line, staff, and functional authority
- responsibility cannot be delegated
- accountability and controllability; only be held responsible for what you can control

#### 3) Development of budgets and standards

- can develop congruence
- either participative (communication, longer and more costly, motivational) or authoritative (control, be involved and show interest)
- reduce budgetary slack

### 1) Responsibility centres and responsibility accounting

- each responsibility centre makes its own budget and then consolidates them together
- enables evaluation of subunits performance; manager or unit; expand or promote?
- a. cost (efficiency)- service department
- b. revenue- effectiveness
- c. profit- efficiency and effectiveness
- d. investment- profit + investments; effectiveness; as many of these as possible
- compare actual to budgeted; get feedback on the variance so can plan and control
- timely and MBE, no blame
- only the manager's control should be evaluated; maybe contribution
- information and knowledge are important as well
- a. allocation of common costs**
- 1 way to determine how financials results are figured
- are shared between responsibility centres; service departments like IT, HR, and accounting
- allocation should motivate managers, provide incentives for goal congruence, and be fair
- could be on cause and effect basis
- usually on budgeted contribution or budgeted revenues basis; exceeding sales may prove a punishment
- all costs must be allocated
- allocate a % of each department's contribution to the costs

- stand alone and incremental (primary and incremental users) cost allocation methods
- MBO needs clear communication, or sub-optimization can occur

## **2) Performance feedback**

- annual review process; for employees and production
- consistency and timeliness are important
- financial and non-financial- geographic and product-line basis
- multiple measures to gauge different activities
- responsibility centre classification is important

### ***a. criteria used in performance evaluations***

- task outcomes, not means; behaviour and traits

### ***b. who should evaluate an employee***

- employer, peer, self, and 360

### ***c. potential problems in the evaluation itself***

- halo effect, central tendency error, recency effect, differing standards, rater bias, contrast error, forced normal distribution

### ***d. multiple measures of performance and the balanced scorecard***

- financial performance, customer satisfaction, internal business processes, learning and growth
- multiple measures must be used
- issues with- difficult to compare across units, needs extensive ERP, non-financial data has no control or audit
- gives a strategy map to follow

## **3) Transfer pricing**

- used by profit and investment centres for costs from service departments and revenues to other departments when there is an outside market; vertically integrated companies
- cost centre works on pure cost basis
- market price, cost of production + opportunity cost, full cost, variable cost, cost plus, negotiation, dual pricing
- market price is theoretically best
- cost based best when not required to buy from internally
- goals, capacity, and different state and national tax rates

## **4) Management compensation**

- salary, bonus, and benefits
- support the company's strategic objectives, aversion to risk, and ethical issues

# III. Marketing

## I. Marketing Preliminaries

- Connect with Customers
- Identify Market Segments
- Create Brand Equity
- Craft Brand Positioning
- Deal with Competition

## II. Strategic Planning

- Planning
- Capital Budgeting and Capacity Planning
- Business Process Performance

## III. Strategic Marketing

- Strategic Marketing
- Managing Marketing Information
- Market Segmentation, Targeting, and Positioning
- Managing Products and Services
- Pricing Strategy
- Promotional Mix and Distribution Strategy

## IV. Decision Theory

- The Decision Making Process

### **Initial Marketing Technique**

- Responsive marketing** identifies a specific need and then fills it
- Anticipative marketing** looks ahead into what needs customers may have in the near future
- Creative marketing** discovers and produces solutions customers did not ask for but to which they enthusiastically respond

The market the company operates must be defended. **Continuous innovation** will solve this; continuous innovation is an offshoot of the marketing strategies described above.

### **Desired Qualities**

- premium performance, extensive and efficient dealership system, superior service, full-line strategy, good financing
- marketing is essentially just defending and attacking.

### *5 Critical Steps*

**Connecting with Customers and Analyzing Consumer Markets.**

**Identify Market Segments and Targets.**

**Create Brand Equity**

**Craft the Brand Positioning**

**Deal with Competition**

## Connecting with Customers and Analyzing Consumer Markets.

*Identify consumer psychology.*

**Culture**- the fundamental determinants of a person's wants and behaviours

**Subculture**- provides more specific identification and socialization for their members

**Social class**- relatively homogeneous and enduring divisions in society, which are hierarchally ordered and whose members share similar values, interest and behaviours

**Roles**- the activities a person is expected to perform

**Status**- each role carries a status

**Brand personality**- the specific mix of human traits that may be attributed to a particular brand; sincerity, excitement, competence, sophistication, ruggedness

*How you can manipulate psychological attributes of the customers to get them to buy your product.*

## Identify Market Segments and Targets.

*Find the niche*

**Flexible market offering-** includes naked solution and discretionary options.

Homogeneous, diffused, and clustered preferences

**Customerization-** combines operationally driven mass customization with customized marketing in a way that empowers consumers to design the product and service offering of their choice

**Psychographics-** the science of using psychology and demographics to better understand consumers

*Geographic, demographic, and behaviour segmentation.*

**Supersegment-** a set of segments sharing some exploitable similarity

**Megamarketing-** the strategic coordination of economic, psychological, political, and public relations skills to gain the cooperation of a number of parties in order to enter or operate in a given market

*Evaluate and critique the market segment selected for possible changes.*

## Create Brand Equity

**Brand equity**- the added value endowed to products or services; may be reflected in how consumers think, feel, and act with respect to the brand, as well as the process, market share, and profitability that the brand commands for the firm; important intangible asset with psychological and financial value to the firm

**Brand knowledge**- all the thoughts, feelings, images, experiences, beliefs, and so on that become associated with the brand

**Brand promise**- the marketer's vision of what the brand must be and do for consumers  
Choose the correct brand elements to build the brand equity.

**Brand elements**- those trademarkable devices that's serve to identify and differentiate the brand; 6 criteria- memorable, meaningful, likeability, transferable, adaptable, protectible

**Brand tracking**- collecting information from consumers on a routine basis over time

**Brand valuation**- the job of estimating the total financial value of the brand

*Brand reinforcement.*

*Brand revitalization, brand crisis*

**Brand portfolio**- the set of all brands and brand lines a particular firm offers for sale to buyers in a particular category; different brand may be designed and marketed to appeal to different market segments



## Craft the Brand Positioning

*Develop and communicate the positioning strategy.*

**Positioning-** the act of designing the company's offering and image to occupy a distinctive place in the mind of the target market

*Determine category membership*

**Category membership-** the products or sets of products with which a brand competes and which function as close substitutes

*Choose and create points-of-parity and points-of-difference.*

**Points of parity-** category or competitive(negate competitors points of difference); can find with the other brand

**Points of difference-** can't find with the other brand

**Product differentiation-** best quality

**Personnel differentiation-** better trained people

**Channel differentiation-** companies can achieve competitive advantage though how they design their channel's coverage, expertise, and performance

**Image differentiation-** identity, how the company aims to identify or position itself or its product; image- the way the public perceives the company or its products

*Product life cycle:*

**Introduction stage-** slow growth at this stage

**Growth stage-** period of rapid market acceptance and substantial profit improvement

**Maturity stage-** slowdown in sales growth because the product has achieved acceptance by most buyers

**Decline stage-** sales show a downward drift and profits erode

## Deal with Competition

Identify, analyze, and select competitors.

**Strategic group-** a group of firms following the same market strategy

Expanding market share.

Defending market share.

*Premium performance, extensive and efficient dealership system, superior service, full-line strategy, good financing*

### Defence Strategies

**Position defence-** involves occupying the most desirable space in the minds of the consumers, making the brand almost impregnable

**Flank defence-** market leader should also erect outposts to protect a weak front or possibly serve as an invasion base for counterattack

**Preemptive defence-** attack before the competitor attacks

**Counteroffensive defence-** counterattacking; attacking the competitors' main area so they have to pull back in their new area

**Mobile defence-** broadening over new territories through market broadening and market diversification

**Contraction defence-** planned contraction, strategic withdrawal

### Attack Strategies

**Frontal attack-** the attacker matches its opponent's product, advertising, price and distribution; the side with the most resources will win

**Flank attack-** an enemy's weak spots are targeted; geographic or segmental

**Encirclement attack-** launching a grand offensive on several fronts; blitz; believes they can break the competitors will quickly

**Bypass attack-** diversifying into unrelated products, diversifying into new geographical markets, and leapfrogging into new technologies to supplant old ones

*Competitor or customer cantered company.*

Obsessing over competitors or consumers

# **CMA 3**

## **Strategic Planning**

### **1. Planning**

Types of Planning

Strategic Planning

The Strategic Planning Process

### **2. Capital Budgeting and Capacity Planning**

Contingency Planning

Manufacturing Paradigms

### **3. Business Process Performance**

The Value Chain

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Target Costing

Business Process Reengineering

## **Strategic Marketing**

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The Personal Selling Process

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Marketing and Distribution Channels

**Decision Theory**

**1. The Decision Making Process**

Relevant Information

Steps in Reaching a Decision

## Strategic Planning

-includes strategic and tactical planning, manufacturing paradigms, and business process performance

### 1. Planning

-the process of planning is as important as the resulting plan

#### *Types of Planning*

\***strategic**- developed from the company's mission statement; determined by top management; broad, general long-term; outline priorities and resource allocations

\***tactical**- developed from the strategic plan to implement specific parts of the strategic plan; made by middle and upper managers; intermediate, 1 to 5 years

-are quantitative in nature and revolve around production, expenditures, inventory; identifies who is responsible for the different elements of the plan

\***operational**- developed from tactical plans to achieve operational goals; budget planning; middle and lower level managers; short term

-day2day operations and provide the basis for the master budget; can also be for a single purpose or project

-tactical and operational must be congruent with the strategic

#### *Strategic Planning*

-defines the corporate mission, addresses the long-term objectives of the organization and covers periods greater than 1 year; examines both external and internal factors

-is directional rather than operational; focuses on where the company wants to go, not on how it is going to get there

-goal is to achieve: superior performance, competitive advantage, profitable growth, and profitability

\***strategy**- a set of actions taken by managers of a company to increase the company's performance

\***strategy formulation**- process of selecting strategies

\***strategy implementation**- process of putting the selected strategies into action; involves: designing, delivering and supporting products; improving efficiency and effectiveness of operations; and designing the organization structure, control systems, and culture

\***business model**- the manager's idea of how the set of strategies and capital investments that the company makes should fit together to generate profitability and profit growth

\***profitability**- measured in terms of the return on invested capital; ROIC, efficiency; stockholder's equity and long-term debt

\***profit growth**- measured by the increase in net after tax profit; new sales or expansion

-purpose of strategic plans is to guide the company; the plan is continuously rolled forward

#### *The Strategic Planning Process*

### 1. Define the Company's Mission by Its Mission Statement

#### *Mission Statement*

-must be thought of in terms of the customer: groups, needs, and means

1. company's reason to be
  2. vision, or statement of a desired future state
  3. statement of organization's values
  4. statement of major goals
- the company is applying a particular skill in order to satisfy a particular need for a group of customers
  - the values are the foundation of the organizational culture

## **2. Analyze the External Environment**

- to identify opportunities and threats
- 3 interrelated environments: industry, country or national, macroenvironmental

### ***Porter's 5 Forces***

- strong competitive forces are threats and weak competitive forces are opportunities

1. risk of entry by potential competitors
2. intensity of rivalry among established companies within an industry
3. bargaining power of buyers
4. bargaining power of suppliers
5. closeness of substitutes to an industry's products

## **3. Analyze the Internal Environment**

- to identify strengths and weaknesses
- a sustained competitive advantage is the primary objective of strategy
- competitive advantage results from: distinctive competencies and profitability

### **1. Distinctive Competencies**

- results from 2 things
  - leads to superior efficiency, quality, innovation, and customer responsiveness
1. resources- tangible or intangible
  2. capabilities- ability to coordinate resources
- strategies can build new resources and capabilities or strengthen existing ones; distinctive competencies will shape the strategies

### **2. Profitability**

- derived from perceived value, prices, and costs
- the value customers receive is the utility
- the price charged will be less than the utility customers place on the product; this difference is the consumer surplus
- company must evaluate its value chain to do this: comprised of primary and support activities

**\*primary activities-** R&D, production, marketing and customer service related to the design, creation and delivery of the product

**\*support activities-** provide inputs that allow the primary activities to function; materials management, human resources, information systems, company infrastructure

**\*durability-** how long the competitive advantage will last; barriers to imitation, prior strategic commitments and absorptive capacity, dynamism of environment (how quickly it is changing)

### ***3 Factors Contributing to Failure***

1. inertia, reluctance to change strategies
2. prior strategic commitments, like investments
3. Icarus paradox; doing things the same way

#### ***4 Tactics to Avoid Failure***

1. superior efficiency, quality, innovation, responsiveness to customers
2. continuous improvement and continuous learning
3. benchmarking
4. internal forces of inertia

#### **4. SWOT Analysis**

- internal and external combination
- select the strategies that will do the best to align the company's resources and capabilities to the demands of the environment
- the 4 strategies should work with each other; SWOT analysis allows the company to pick the best business model or to fine tune their business model

#### ***4 General Strategies***

##### **1. Functional-Level Strategy**

- for the purpose of improving operations within the company; manufacturing, marketing, materials management, product development, customer service
- focuses on improving superior efficiency, superior quality (reliability & excellence), superior innovation, to achieve superior responsiveness to customers
- implementing: management by exception or management by objectives

##### **2. Business-Level Strategy**

- position of the business in the marketplace as well as different positioning strategies
- implementing: product structure, market structure, geographic structure, matrix structures, product-team structures
- utilize restructuring or business process reengineering

#### ***3 Main Decisions to Consider***

1. customer's needs and what needs are to be satisfied
  - tradeoff between differentiation and cost leadership, or lowest cost structure
2. what products should be offered and to which customer groups- market segments
3. how customer needs are to be satisfied, using the company's distinctive competencies

#### ***4 Generic Competitive Strategies***

1. cost leadership- decreased profitability
2. focused cost leadership- narrow market segment
3. differentiation- superior innovation, excellent quality, responsiveness to customer needs; true differentiation has no competitors
4. focused differentiation- 1 or 2 segments or niches

#### **3. Global Strategy**

- considering how to expand outside the home country
- \***location economies**- finding the cheapest markets all over the world for production

#### ***4 International Strategies***

- 1. global standardization**- focuses on cost reductions from economies of scale and location economies; standardized product world-wide
- 2. localization**- works to increase profitability by offering goods or services that are customized for each different national market
- 3. transnational**- used when requirements for local responsiveness are high and cost pressures are strong; centralized manufacturing with local specifics; difficult to attain
- 4. international**- most enviable; low local needs and low competition (low cost cutting needs); centralized location with local distribution centres

***Other Decisions***

1. selecting international markets
2. timing of entry- early has pioneering costs
3. scale of entry- large entry has large strategic commitment

***Best Mode for Entry***

1. exporting
2. licensing
3. franchising
4. joint venture with host country- 51/49
5. wholly owned subsidiary in host country- buy an existing company

**4. Corporate-Level Strategy**

-what business or businesses the company should be in to maximize profitability and profit growth

***5 Options***

1. horizontal integration
2. vertical integration
3. strategic alliances
4. strategic outsourcing
5. diversification

***3 Ways Diversification Reduces Profitability***

1. changing conditions
2. diversification for the wrong reasons- people can diversify with different companies, not the same company diversified itself
3. diversification creates bureaucratic costs

**5. Develop and Implement the Chosen Strategies**

\***organizational design**- implementing strategy involves how to use the organizational structure, corporate culture, and control environment

-analysis of organizational design can lead to redesigning of organizational structure

***3 Inputs*****1. Organizational Structure**

-who should do what, how they should do it, and how they should work together

***3 Questions***

1. how to group tasks into functions, and group functions into business units or divisions
2. how to allocate authority and responsibility to the functions and divisions
3. how to increase the coordination or integration between and among functions and divisions, and how to maintain and increase them as the structure evolves

-tall v. flat hierarchy; centralized v. decentralized

-integrating mechanisms: direct contact, liaison roles, teams

**2. Control Systems**

-provide managers with incentives and motivation and feedback systems

-TOC, TQM, ABC

**3. Organizational Culture**

-norms, values, and beliefs the company shares and holds

***3 Main Values of Organizational Culture***

1. values that promote action; autonomy for employees and managers
2. business model is focused on its mission



3. organizational design motivates employees to do their best

## **2. Capital Budgeting and Capacity Planning**

-capacity is the ability to produce products or services: capital resources capital budgeting

- a company may try to: preempt competition or proceed cautiously

### **Contingency Planning**

-involves considering alternatives to respond quickly to future events, generally external, that are often unpredictable

-also may have internal contingencies such as: changes in culture, design, or mission, or objectives

### **Manufacturing Paradigms**

-a paradigm is a standard, and a paradigm shift is a transformation

#### **6 Main Systems**

##### **1. JIT**

-pull not push system; lean production and manufacturing cells or work cells

##### **2. MRP**

-materials requirements planning; dependent demand inventories; push system

##### **3. Kanban**

-visual record; uses time cards or tickets

##### **4. Outsourcing**

-could be cheaper

##### **5. TOC**

-throughput, throughput time, and throughput contribution

-bottlenecks, drums, buffers, ropes

##### **6. ABC**

-TOC is short term (profitability analysis) while ABC is long-term (profit and price planning)

#### **5 Other Systems**

1. Computer Integrated Manufacturing CIM

2. Computer Aided Design CAD

3. Flexible Manufacturing Systems FMS

4. Robots

## **3. Business Process Performance**

### **The Value Chain**

-identify activities to add value; identify cost drivers; build competitive advantage

### **Monitoring Quality**

-4 m's: machines, materials, methods, manpower

#### **5 TQM Methods**

1. control chart- statistical control

2. histogram

3. Pareto- 20/80

4. Ishikawa- cause-and-effect

5. benchmarking- best practices analysis

#### **Target Costing**

-target price, ideal standards, kaizen (continuous improvement)

**Business Process Reengineering*****3 Steps***

1. identify distinctive competencies
2. determine series of processes
3. focus on processes, not functions; horizontal processes

# Strategic Marketing

## 1. Strategic Marketing

-marketing involves promoting, selling, and distributing commercial products or services  
 -marketing is a matter of satisfying customer needs to provide superior value; it is strategic in nature, and focuses on creating value for customers

### Strategic Role Within the Firm

#### *4 Organizational Levels Within the Firm*

1. corporate- overall strategic corporate plan
2. division- division plans for allocation of funds to each business unit
3. business unit- strategic plans
4. product- marketing plan for each product level

\***business portfolio analysis**- is where management identifies the company's key businesses, called strategic business units SBU

-SWOT analysis, marketing environment

\***strategic group**- group of companies that follows a similar strategy in the same target market

#### *Porter's Generic Strategies*

1. cost leadership
2. differentiation
3. focus- narrow segment
4. competitive scope

#### **Competitive Strategies for Change**

-must sustain competitive advantage in different types of industry environments and in the evolution of its own industry life cycle

#### *6 Different Industry Environments/Life Cycle*

1. fragmented- small and medium sized businesses; competitive strategy is chaining, franchising and horizontal merger
2. embryonic- starting to develop
3. growth- demand has taken off
4. shakeout- growth slows down
5. mature- market becomes saturated
6. declining- demand drops; product life-cycle dies

-globalization will affect industry structures in almost all industries

-4 components of internal competitive advantage: efficiency, quality, innovation, responsiveness

3 steps to internal analysis: understand importance; recognize importance of 4 factors to profit enhancement; analyze resources

#### **Setting Company Marketing Strategies**

-goals result from the strategic planning process

\***marketing objectives**- goals for increasing profits by increasing sales

\***marketing plan**: strategic marketing plan (outlines value proposition); tactical marketing plan (marketing tactics)

### **The Marketing Management Process**

-marketing mix is created to appeal to target customers

4 P's: product, place, price, promotion

#### ***4 Steps to Segmentation***

1. demand measurement and forecasting

2. market segmentation

3. market targeting

4. market positioning

### **The Marketing Mix**

-4 P's: product, place, price, promotion

-marketing planning involves marketing strategies and marketing implementation and marketing control procedures

### **The Value Chain in Relation to Strategic Marketing**

-must create ways to deliver superior value to customers

-strong capabilities: market sensing process, new offering realization process, customer acquisition process, customer relationship management process, fulfilment management process

-must appreciate competencies, resources, and capabilities

-must sustain competitive advantage through: customer value and customer satisfaction

## **2. Managing Marketing Information**

-need a marketing information system MIS to perform analysis, planning, implementation, and control

### **Assessing Marketing Information Needs**

-must determine what information the managers need

### **Developing Marketing Information**

-marketing information comes from: internal data, marketing intelligence, and marketing research

#### ***4 Steps to Marketing Research Process***

1. define problem and research objectives

2. develop the research plan

3. implement the research plan

4. interpret and report the findings

### **Customer Relationship Management**

-CRM involves data mining, data warehouse, and database marketing

-available CRM software: contact management software, lead management software, self service CRM, survey management software, call centre software and help desk software

### **Distributing and Using Marketing Information**

-use of intranets and extranets is becoming useful

## **3. Market Segmentation, Targeting, and Positioning**

-mass marketing involves market segmentation and market targeting

3 steps: segmentation, targeting, and positioning STP

\***target marketing**- involves 4 levels: segments, niches, local areas, and individuals

## **Segmenting Consumer, Business and International Markets**

### ***4 Different Consumer Variables***

1. geographic
  2. demographic- age, gender, religion, race
  3. psychographic- lifestyle, personality
  4. behavioural- benefits, usage rate, loyalty
- political, legal, economic factors all affect segmentation  
 -requirements for effective market segmentation: measurable, accessible, substantial, differentiable, actionable

### **Market Targeting**

#### ***3 Types market-Coverage Strategies***

1. undifferentiated marketing- mass marketing
  2. differentiated marketing- targeting several market segments
  3. concentrated marketing- targeting a large share of 1 or a few niche markets
- market-coverage strategy will depend on: resources, product variability, life-cycle stage  
 -socially responsible target marketing: can't try to profit at the expense of a targeted segment

### **The Positioning Strategy**

- position is defined by the way customers perceive the product  
 \***positioning** - defining the product in the minds of the customers  
 \***unique selling proposition**- advocates promoting only 1 product benefit, on the basis that people remember £1; double and triple benefit positioning as well  
 -foundation for all marketing strategy is STP

## **4. Managing Products and Services**

### **Products and Services: The Differences**

- products are commodities and services are actions  
 -5 classifications of goods and services

#### ***Durability and Tangibility Goods***

1. nondurable goods- food
2. durable goods- clothes
3. services

#### ***Consumer Goods***

1. convenience goods- staples, impulse, emergency; cigarettes and milk
2. shopping goods- sofa, refrigerator
3. specialty goods- motorcycle, wedding dress
4. unsought goods- don't think about buying; life insurance

#### ***Industrial Goods***

1. materials and parts- raw and manufactured materials
2. capital items- long-lasting installations and equipment
3. supplies and business services- maintenance and operating

#### ***Other Marketable Entities***

1. organization marketing
2. person marketing
3. place marketing

#### 4. idea marketing

##### **Product Decisions**

- based on: attributes, branding, packaging, labelling, product support services
- attributes include: product quality, product features, and product style and design
- branding includes: brand identity, brand bonding, brand equity

##### **Product Line Decisions**

- most important decision is the product line length
- \***stretching**- product line is enlarged beyond its current range
- \***product line filling**- adding products within the current range of the line; upper and lower limits
- product mix is also known as product assortment
- based on: width (different), length (total), depth(variants of each width), and consistency

##### **Services Marketing**

- services are intangible acts

##### **4 Characteristics**

1. intangibility
2. inseparability
3. variability
4. perishability

- service marketing strategy includes, in addition to traditional strategy: internal marketing and interactive marketing (quality of interaction between buyer and seller)

##### ***3 Tasks for Successful Service Organizations***

1. differentiate itself
2. manage service quality
3. manage productivity

##### ***3 P's for Service Marketing***

1. people
2. physical evidence
3. process

- post purchase service is important for aftercare

##### **International Product and Services Marketing**

##### ***3 Ways to Manage International Activities***

1. export department
2. international division
3. global organization

##### **New Product Development**

- add new products between acquisition or development
- best strategy is for both unique and superior products
- must have a clearly defined product concept

##### ***8 Steps for New-Product Development***

1. idea generation- culture or innovation
2. idea screening
3. concept development and testing- product concept and concept testing
4. marketing strategy development
5. business analysis
6. product development

7. test marketing
8. commercialization

### **Product-Life-Cycle PLC Strategies**

#### ***5 Stages***

1. product development stage- no sales and no revenues
2. introduction stage- create trial of the product
3. growth stage- maximize market share
4. maturity stage- maximize profit while defending market share
5. decline stage- reduce expenditures and milk the product

### **5. Pricing Strategy**

-of 4 P's of marketing mix, only price produces revenue, the rest product costs

#### **Internal Factors Affecting Pricing Decisions**

##### ***4 Factors***

1. marketing objectives
2. marketing mix and strategy
3. costs
4. organizational considerations

#### **External Factors Affecting Pricing Decisions**

##### ***3 Factors***

1. market and demand
2. competitor's activities
3. other external factors

##### ***3 Pricing Strategies***

1. cost-based approach- break-even or target profit
2. value-based approach- based on buyer's perception
3. competition-based approach- going-rate pricing

##### ***New Product Pricing Strategies***

1. market penetration pricing
2. market skimming

##### ***Product Mix Pricing Strategies***

1. product-line pricing
2. optional-product (feature) pricing
3. captive-product pricing
4. by-product pricing
5. product-bundling pricing- pure or mixed bundling

#### **Price Adjustment Strategies**

##### ***6 Types***

1. discount and allowance pricing- cash, quantity, trade, seasonal discounts
2. segmented pricing- customer-segment; product-form; location; time
3. psychological pricing- reference prices
4. promotional pricing- loss leaders, special-event, cash rebates
5. geographical pricing- FOB; uniform-delivery; zone; basing-point pricing
6. freight-absorption- seller pays all or part

#### **International Pricing**

-must deal with price escalation

### **3 Options**

1. market-based price for each country
2. uniform price for each market
3. cost-based for each country

-transfer prices, dumping, and countervailing measures will also be considered

### **Public Policy Issues**

1. packaging and labelling
2. excessive cost on packaging
3. pollution
4. scarce resources

-additionally, laws and regulations regulate advertising and sales reps

### **Specific Price Decisions and Public Policy**

#### **Must Avoid**

1. price fixing
2. predatory pricing
3. price discrimination
4. resale price maintenance
5. price increases
6. deceptive pricing- price confusion

### **The Bottom Line in Pricing Decisions: The Buyer**

-price demand relationship is down-ward sloping

-prestige goods have an upward sloping demand curve

-goods can be either elastic (more likely to decrease prices) or inelastic (more likely to increase prices)

## **6. Promotional Mix and Distribution Strategy**

### **5 Modes of Communication Make up Marketing Communications Mix; Promotion Mix**

1. advertising- TV, radio, newspaper
2. sales promotion
3. public relations- marketing public relations MPR
4. personal selling
5. direct and interactive marketing- nonpublic, immediate, customized, interactive

### **The Need for Integrated Marketing Communications**

-company must send the same message to all customers in all markets

-integrated marketing communications IMC

### **Selecting the Communications Mix**

-must consider the promotional mix; unique characteristics

### **Promotional Mix Strategies**

#### **2 Options**

1. push promotion- sell the finished goods
2. pull promotion- create demand first

### **The Advertising Process**

-many companies work with an advertising agency



### ***5 Step Process***

- 1. mission-** informative, persuasive, comparative, reminder
- 2. money, budget-** affordable method, % sales, competitive-parity, objective-and-task
- 3. message-** message generation, evaluation and selection of message, execution, format, review of social responsibility
- 4. media-** reach frequency and impact; major media types; specific media vehicles; media timing
- 5. measurement-** community effect research; sales effect research

### **The Sales Promotion Process**

-consumer promotions, trade promotions, sales force, customer relationships, consumer protection tools, trade promotion tools, business promotion tools, evaluation

### **The Public Relations Process**

-important for building good relationships

### **The Personal Selling Process**

-order takers and getters; salespeople represent the business and the customers; must understand and meet the customer's needs and retain the customers

### **The Direct Marketing Process**

-forms: face2face; direct mail; catalogues; telephones; other media; kiosk; e-marketing

-customer databases are important

-ethical issues with irritation and intrusion of privacy can result

### **Summary-Promotional Mix**

-companies must allocate their promotion budget over these 5 modes of marketing

-use integrated marketing communications

### **Marketing and Distribution Channels**

-each intermediary level is a channel level; each product moves through the length of the channel

**\*direct marketing channel-** when the product moves directly from the producer to the consumer

**\*conventional marketing channel-** independent producers, wholesalers, and retailers

**\*vertical marketing system VMS-** producer, wholesaler, and retailer

**\*horizontal marketing system-** supermarket offering banking services

**\*multichannel marketing system; hybrid-** when the company uses 2 or more marketing channels

**\*channel disintegration-** when each separate entity goes its own separate way instead of building on each other

**\*disintermediation-** use of technology to do away with middlemen and go directly to the consumers

-each channel must analyze customer needs, establish channel objectives and constraints, and identify and evaluate all major alternatives

-can use intensive, exclusive, or selective distribution

-must analyze: economic criteria; control issues; adaptive criteria; global considerations

## Decision Theory

### **1. The Decision Making Process**

-some decisions to be made: pricing, alternative manufacturing options, R&D, marketing, distribution, contract negotiations, outsourcing decisions, capital budgeting decisions

#### **Relevant Information**

-incremental and differential costs

-avoidable and unavoidable cost

-opportunity costs

#### **Steps in Reaching a Decision**

1. obtain information

2. identify alternative courses of action

3. determine the criterion or criteria that will be used to evaluate the alternatives

4. make predictions about future costs and revenues, as well as qualitative factors

-operations research, simulation, sensitivity analysis, linear programming, queuing theory, decision trees, monte carlo method

5. choose an alternative

6. implement the decision

7. evaluate performance to provide feedback

## III. Ethics

### Morality

#### *2 questions*

- 1) Will my actions be fair and just to all parties affected?
- 2) Would I be pleased to have my closest friends learn of my actions?

#### *Business ethics*

- systematic study of morality as applied to the business world
- incorporated 1) formally through value or mission statements 2) informally through peer pressure and environment management sets
- corporate ethical standards influence the behaviour of employees
- foreign countries may have different standards
- ethics standards attempt to distinguish between:
  - 1) general understanding of what is considered to be right or wrong
  - 2) compliance with laws and regulations, both internal and external
  - 3) resolution of conflict
  - 4) conflict of interest
  - 5) whistle blowing
  - 6) bribes and kick-backs
  - 7) social responsibilities
- external and internal factors influencing unethical behaviour
  - 1) individual level- personal judgment depends on life experiences, education, and social status
  - 2) organizational level- management style, group dynamics, promotion system, performance evaluation, and budgeting and reporting process, overall business condition: when good and salary good everyone is happier
  - 3) external level- competitors, investors, partners, customers, governments (especially foreign)
- opinions are divided as to what is ethical
- no one code can cover everything
- 1 good measure is whether it benefits everyone as a whole, more good benefits: include society and nature
- SOX and backdating options

***Statement IC***

Practitioners of management accounting and financial management have an obligation to the public, their profession, the organizations they serve, and themselves to maintain the highest standards of ethical conduct. In recognition of this obligation, the IMA has promulgated the following standards of ethical professional practice. Adherence to these standards, both domestically and internationally, is integral to achieving the Objectives of Management Accounting. Practitioners of management accounting and financial management shall not commit acts contrary to these standards nor shall they condone the commission of such acts by others within their organizations.

**Principles**

- 1) Honesty
- 2) Fairness
- 3) Objectivity
- 4) Responsibility

**Standards**

Each member has a responsibility to:

**1) Competence**

- maintain knowledge via CPE
- perform duties according to laws, regulations and technical standards
- provide DSI and recommendations that are timely, concise, accurate and clear
- recognize and communicate limitations and constraints

**2) Confidentiality**

- keep info confidential unless disclosure or legal needed
- inform all relevant parties; watch subordinates properly
- refrain from using confidential info for unethical or illegal advantage

**3) Integrity**

- mitigate and avoid conflicts of interest; advise all parties of potential conflicts
- refrain from conduct that prejudice carrying out duties ethically
- abstain from activity that might discredit profession

**4) Credibility**

- communicate info fairly and objectively
- disclose all relevant info
- disclose all delays and deficiencies

***Resolution of ethical conflict***

- 1) immediate supervisor; groups like the board
  - only with clear violation, not appropriate to contact the others
- 2) IMA ethics counsellor or other impartial advisor
- 3) personal attorney

## Legality

### **International Business Law**

-difficult to enforce, but most countries comply because it facilitates commerce

#### ***Sources of International Law***

1. customs- accepted methods
  2. treaties- formal agreements
  3. conventions- treaties among multiple countries
  4. judicial precedents
  5. international political organizations- ICJ, UN
  6. international trade committees and agreements- WTO, NAFTA, EU
- to avoid double taxation, countries adopt tax treaties or use offshore shelters

### **Forms of Business Organization**

#### ***3 Main Forms***

##### **1. Corporation**

-legal separation from owners, limited liability, easy transfer of ownership, easy to raise capital

-double taxation, and loss of ownership

##### **2. Partnership**

-each person responsible for debts; easier to form

-multiple types

-limited liability partners can exist

-do not pay taxes, partners do

-joint ventures are usually created for 1 transaction

-LLC is a hybrid between partnership and corporation; members, not partners

##### **3. Sole Proprietorship**

-easiest to form

-1 person, all control, all liability

### **Contract Law**

-law that is founded in judge-made (common law)

-governs realty and personal service

-transactions involving sale of goods governed by Article 2 of UCC; UCC overrides common law

-will be 1 and 2; can not be 3

#### ***Types of Contracts***

1. bilateral v. unilateral

\***bilateral**- promise for a promise; each person gives a promise

\***unilateral**- promise for an act; person performing act must be aware of the promise

2. executed v. executory

**\*executed**- been fully performed

**\*executory**- not been fully performed

3. void v. voidable

**\*void**- not enforceable against either party; illegal reasons or no agreement

**\*voidable**- one party can cancel without penalty

### *Elements of Valid Contracts*

#### **1. Offer**

-to be valid must be: 1) seriously intended (reasonable person test) 2) communicated (words or actions) 3) definite in terms (time, quantity, and price stated)

-advertisements and price quotes are not offers; invitations to bid

#### *Revocation of an Offer*

1. effective when received by the offeree, not sent by offeror

2. offeror can revoke any time before acceptance

3. offeror can guarantee being open, but can still revoke

#### *Exceptions*

1. when consideration is paid, must keep open; option contract

2. firm offers governed by UCC are irrevocable

3. offer ends when stated by offeror; no time stated, reasonable person test

#### **2. Acceptance**

##### *2 Requirements*

##### **1. unconditional**

-offeree must comply with all offeror's terms and conditions

-requests and inquiries do not end an offer; counteroffer ends an offer; rejection ends an offer; revocation ends an offer; death or insanity ends an offer; destruction of the subject matter ends an offer; sale of subject matter ends an offer

##### **2. communicated**

-can be through words or actions

#### *Effective Acceptances*

-acceptance is not assignable

1. mailbox rule- when mailed is effective

2. faster means of acceptance- if not stated ok

3. slower means of acceptance- effective only when received

#### **3. Consideration**

-what is given up in the contract

#### *Issues*

1. legally sufficient

2. not limited to money

3. past consideration is not legally sufficient

4. pre-existing obligations are insufficient consideration

-when a contract term is changed, must be new consideration provided

#### **4. Proper Form**

-generally no excepted form or format; not have to be in writing

-under the Statute of Frauds, some contracts must be in writing; does not have to be signed, but is enforceable against whoever signed it

-terms of the agreement may be contained in more than 1 contract

#### *5 Contracts Statute of Frauds*

1. sale of goods \$500 or more
2. realty contracts
3. long-term contracts; more than 1 year
4. assumption of the debt of another person
5. marriage contracts

### **5. Lawful Object**

- subject matter must be legal
- non competes are legal as long as they are reasonable

### **6. Competent Parties**

- must be mutual assent, meeting of the minds

### **3 Incompetent Parties**

1. minors (legal infants)- 18, can disaffirm contracts
2. incapacitation due to drug abuse
3. insanity- must be adjudicated insane

### **Legal Evidence**

\***audit evidence**- physical, testimonial, documentary, analytical

\***legal evidence**- relies heavily on oral testimony

-secondary, primary, direct, circumstantial, conclusive, corroborative, opinion, hearsay

### **Standards of Legal Evidence**

1. sufficient evidence- professional judgment, materiality, inherent risk
2. competent evidence- good evidence, supports the conclusion
3. relevant evidence- related to the task at hand

### **Government Legislation**

-regulation on business, taxation schemes, contracts, legal evidence, key economic indicators, international trade

### **1. Government Regulations**

-all business are subject to laws

#### **3 Types**

#### **1. Environmental Law**

-usually vary from country to country, but can have international protocols; hard to enforce

3 types: clean air legislation, clean water legislation, treatment and disposal of hazardous wastes

-International Protection of the Ozone Layer- US and 23 other countries, 1987

#### **2. Securities Regulation**

-to prevent fraudulent practices relating to the issuance and trading of securities

-SEC, 1933 and 1934

#### **3. Antitrust Regulation**

-makes competition more fair

-illegal practices: price-fixing, division of markets, group (collective) boycotts, resale price maintenance, monopolistic mergers, exclusive dealing, tie-in-sales, price discrimination, interlocking directorate (>1,000,000 in capital)

-consumer protection laws: product liability, privacy rights, unfair business practices, credit card fraud, misrepresentation, other interactions

### **Criminal Law**

-type committed is a function of the opportunities available

#### **4 Types**

##### **1. blue-collar crime**

-more physical in nature; more obvious

##### **2. white-collar crime**

-tax evasion, embezzlement, fraud

##### **3. corporate crime**

-by the firm for the firm

##### **4. organized crime**

-RICO, 1970

-must be guilty 2 times in a 10 year period; 20 years in jail and \$25,000 fine