**Monetary Economics**

***Gnosis Monetary***

Kevin Sleem

**Index**

1. Current State (Today’s Markets)

2. Monetary Policy

3. Influential Events

4. Exchange Rates

5. InflationRates

6. Interest Rates

7. Employment Rates

8. Poverty Rates

9. Island Economy

**PRESENTE TENSE**

**Basic-Advanced**

**Current State**

*1.1 Global Economy Today*

*1.2 Nature of Money*

*1.3 Money Supply~~Demand*

*1.4 Aggregate Demand~~Supply*

*1.5 Policy Implications*

***Equity and Efficiency***

Money is the foundation of equity; equal distribution to some degree results in equity for those distributed to. However, obtaining an equitable distribution can create issues with efficiency. 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.

Table

**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.

Adam Smith’s invisible hand innovation would argue that no government intervention is needed because the economy will automatically allocate resources efficiently. Conversely, welfare economics, the normative evaluation of markets and economic policy, suggests that some intervention is needed. The 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. The second theorem of welfare economics is that 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.

So if the perfectly competitive market doesn’t provide an efficient allocation, how can one determine the most equitable allocation for all society. The problem is that what is an equitable allocation; different opinions exist on this matter. Social welfare functions apply weights to each individual’s utility in determining what is socially desirable, and utility possibilities frontiers show 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.

***Fractional Reserve Banking***

Paper money began when 16th century in Europe bankers began issuing notes, or receipts in exchange for gold. This was safer and more efficient for larger transactions; thus fractional reserve banking was born. Goldsmiths stored gold coins for their customer for a fee, and issued receipts in exchange. These receipts entitled the person to immediately origin of bank notes. Then this process was taken 1 step further, and the goldsmiths began printing more notes than gold they actually had, thus increasing their profits. No longer 1 to 1 ratio of paper to gold, could be 2 to 3; bankers are no longer storing or warehousing gold for a fee

They are artificially inflating the money supply, and loaning out the phony receipts at interest; this system became known as fractional reserve banking; this system was transferred to the US and Europe. Not allowed in any other business; this is why financial firms fail; banks have been able to get away with it. Alexander Hamilton favored the central bank; he saw it as a symbol of power for the government; thomas jefferson rejected it; andrew jackson killed the next bank. Gold standard introduced in 1834, money of the people, could be inflated or tampered with sending government expenditures skyrocketing.

Abraham lincoln needed money for the Civil War, printed greenbaks, not redeemable in gold. 1879 went back on gold standard, and high growth and prosperity; growth at 4% per year. 1896 Morgan and Rockefellar wanted a central bank for cheap credit and inflated money supply to fuel the expansion of their business empires; so this was sold to the American Public as a greater elasticity of their money. Many banks failed in 1907, and a lender of last resort was needed. 1913 War War I- 3rd Central Bank- Wilson, progressive era, government expansion, special interest deals. Roaring 20s; inflation was hid from economists; 1929 crash lost 1/3 of stock value; speculators defaulted on bank loans and banks in turn defaulted on thei demand deposits.

Bretton-Woods met after World War II. US dollar was redeemable in gold, but only by foreign governments; all other currencies were redeemable for US gold. Vietnam- print more money to not raise taxes; 1971; foreigners began redeeming US dolars for gold, Nixon stopped redeeming gold; now floats among dollars. FDIC holds .5% of all reserves it insured; so we depend on the Fed to step in and print money when we need it. Danger of bankrputcy is what makes banks adhere to sound policies; other organizations are not guaranteed not to fail. Wars are the reason for leaving the gold standard.

Increasing the money suply (fiat money) is an alternative to taxes. Negative effects don’t present themselves until years later, when they can be blamed on the weather or certain businesses or speculators. 10% of demand deposits. Inverted pyramid scheme; $100 in gold results in $10,000 in fractional reserve loans. Driving down interest rates creates investment boom, and which can lead to great crashes. Now everyone watches the Fed; what will they do next; reforms were suggested, but Clinton and Greenspan rejected them, saying more visibility would be a threat to national monetary policy.

***Microeconomics and Macroeconomics***

Microeconomics is the study of how firms and individuals make decisions and how these decision makers interact. A 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, and one commonly uses supply and demand curve graphs. Macroeconomics is the study of the economy as a whole. It plays an important role in political debate and includes growth in incomes, changes in prices, the rate of unemployment, and poverty issues. Macroeconomics suggests that one must explain economic events and devise strategies to improve economic performance, and then he must apply the same principles to changing circumstances. Consequently, they use many of the same tools because macroeconomic events arise from microeconomic interactions.

The 4 microeconomic assumptions are: (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.

***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 is the 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 central bank 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, and 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.

***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 is the relationship between the quantity of goods and services supplied and the price level. There are 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 (2) short run- SRAS.

The LRAS 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. This 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. The SRAS 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.

***Stabilisation Policy***

Shocks to aggregate demand and aggregate supply cause economic fluctuations. Because the central bank can shift the aggregate demand curve via monetary policy, it can attempt to offset these shocks to maintain output and employment at their natural rates. Shocks are simply exogenous changes in the AS and AD curves. Demand shocks are those that shift the aggregate demand curve, and supply shocks are those that shift the aggregate supply curve. These shocks disrupt economic well-being by pushing output and employment away from their natural rates. Stabilisation policy is 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.

AD shocks result from the introduction and expanded availability of credit cards and other demand oncreasing measures. They reduce quantity of money people hold, and 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.

AS shocks alter the prices of inputs and thus the prices of goods. They are sometimes called price shocks because they have a direct impact on the price level. There can therefore be favourable or adverse supply shocks. Stagflation means rises prices (inflation) and falling output. There are 2 options for dealing with adverse supply shock: (1) hold aggregate demand constant and let prices fall eventually, though the cost is a painful recession (2) expand aggregate demand to raise prices permanently while avoiding the recession (accommodating the shock).

***Business Cycle Theory***

AD and AS shocks is what creates a business cycle. The shocks occur and business activity changes and then more shocks occur and business activity changes again. The business cycle is a fact of life, though what isn't a fact of life is the degree of the business cycle. Monetary stabilisation policy, when implemented correctly, can drastically reduce or even nearly eliminate major fluctuations in the natural business cycle. Thus, the decision of how active the monetary policy should be has direct consequences on the duration of and degree of the business cycle. The business cycle and its impact on AD and AS and thus monetary stabilisation policy is consequently of major concern to monetary economics.

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.

4 issues about the steadiness of growth in the Solow Model are: (1) interpretation of the labour market (2) importance of technology shocks (3) neutrality of money (4) flexibility of wages and prices.

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 are: 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. This theory says prices adjust to clear markets just like in microeconomics, and emphasises real changes in the economy to explain fluctuations in real economic variables, not nominal variables like the money supply.

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. Real business cycel theory says technology regresses during recessions; more plausible assumption that technology just progresses less. The Solow residual- %change in output – %change in inputs; measures proportion of output growth that is attributable to technology improvements; shown to be relevant. The 2 issues with Solow Residual are: (1) labour hording- 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.

New Keynesian economics contrasts real business cycle theory and says market clearing models like the real business cycel 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.

Neutrality of money theory assumes monetary policy doesn’t affect real variables such as output and employment; this is premise of real business cycle theory and its most radical assumption. The neutrality of money theory is likely not true, though research has not proved or disproved the theory.

3 Reasons Prices are Sticky in Short-Run include: (1) small menu costs and AD externalities (2) recessions and coordination failure (3) staggering of wages and prices. Menu costs and AD externalities. Aggregate demand externality discusses the 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. 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. Staggering wages 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.

***Efficiency in Production***

Efficiency in production, efficiency in output, and efficiency in exchange can serve to alleviate the impact of AD and AS shocks and thus better stabilise the economy through less need for monetary stabilisation policy. When there is utmost efficiency in production and effiency in allocation of final goods, the markets with be closer to equilibrium. Equilibrium in the markets serves to reduce AD and AS shocks, thereby soothing the business cycles and thereby stabilising the economy. Equally competitve markets, through both governmental regulation and free trade, serve to ensure the best stabilisation of the economy through an equal balance. Goods must be produced in combinations that match people’s willingness to pay for them; for example, an overproduction of automobiles or any 1 good can serve to oversaturate the good markets and possibly stress the financial markets via nonpayment for loans when the produced goods cannot be sold; this serves to destabilise the economy and affect the business cycle.

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. Competitive markets may be inefficient for several reasons: (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. 4 reasons why markets fail include: (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***

Market failure can severely impact AD and AS, thus business cycles and consequently monetary or economic stabilisation policy as well. Asymmetric information occurs when the seller has better information about the product than the buyer; when this happens bad products can have tendency to drive out good products. 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.

Adverse selection, common in insurance markets, arises from asymmtric information and occurs when one cannot distinguish between low risk and high risk, and consequently more high risk parties become involved and the market breaks down from too much risk. 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. Moral hazard, another issue for insurance companies, alters the ability of markets to allocate resources effectively. Moral hazard is 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 is a moral hazard.

 Market Signaling can help sellers 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; Firms signal with guarantees and warranties. Externalities can be positive (pretty garden, too little production) or negative (river waste, too much production). An 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. 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. Negative externalities generate both long-run and short-run inefficiencies; negative externalities encourage too many firms to stay in the industry. Positive externalities result in too little production; a firm does R&D and other firms don’t have to now.

Market failure can be corrected however, and 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, which 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.

Tools for economic objective completion or for valuing money include: (1) inflation targeting (2) interest rate targeting (3) exchange rate targeting (4) money supply targeting and (5) fiscal policy- tax laws.

Externalities are actions taken by either consumers or producers which affects other producers or consumers but its not accounted for by the market price (pollution).

Market is failure is a situation in which an unegulated competitive market is inefficient because prices fail to provide proper signals to consumers and producers because of externalities and lack of information.

**1.1 Global Economy Today**

Today's society is marked by chaos and confusion in the financial markets. We have progressed to a fiat monetary economy, yet we have not figured out how to efficiently regulate a fiat monetrary economy. A fiat society poses issues with money, because the currency representing the money is intrinsically worthless, and the money creation mechanism is concocted with no rule governing its uitilisation. 2 issues arise with the fiat economy: (1) how do we price the money (2) how do we increase the money supply. Increases of the money supply are favoured because decreases would signal a reversion of society. 2 macroeconomic indicators have been identified to price the money: (1) exchange rates (2) inflation rates. These 2 rates represent the state of the money supply, with exchange rates more specifically referring to foreign inflation and inflation rates referring to domestic inflation. The money supply can be increased according to a rule; however, even with a rule there still must be someone to design the rule. Interest rates are equally important, but as a policy tool rather than a measuring stick. Interest rates can be regulated by the government to ensure stability of the economy, in conjunction with a monetary supply rule.

We live in a highly automated and integrated world. In fact, for most transactions, no actual money is exchanged or even physically exists in the form of currency—rather our monetary system is all computer based. When a central bank increases the money supply, with 1 way being buying government securities on the open market (open market operations), 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 vault cash[[1]](#footnote-0) to customers.

The central bank’s monetary management policies are designed to influence investment spending; lower interest rates serve to stimulate investment activities. The 4 primary monetary management theories are: **(1)** change the discount rate- decrease encourages borrowing and lending~~**(2)** open market operations~~**(3)** reserve requirements- affects amount of money available for lending~~

**(4)** moral suasion.

The purpose of this treatsie is to offer perspectives on optimal monetary economics for today’s global environment. By analyzing exchange, inflation, and interest rates specifcally, we can gain a deeper understanding of monetary economics because of the integral role these three mechanisms play in monetary financial markets. The theory presented here emphasizes the importance of these three rates in economic policy making, most specifically for monetary stabilisation policy decisions. Interest rates serve as a monetary policy tool, and also represent direct income to a country; they are the only one of the three major rates that can be directly manipulated by the government, and thus the forward potential of interest rate manipulation does presents policy advantages.

A monetary authority is needed once a society matures to a representative commodity monetary system from a commodity monetary system via the bilateral intermediate barter economic transaction system.[[2]](#footnote-1) A society becomes a monetary society when there is a commonly accepted unit of trade for all transactions, and a fiat society when that commonly accpeted unit is intrinsically worthless fiat currency. Fiat monetary economies are characterized by inflation, which is where the value of intrinsically worthless money loses value as too much is printed and put into circulation. Too much can be measured in terms of relative supply as compared with other fiat economies in which it particpates in business with, or by measuring it as compared to the next wost widely accpeted store of value, which is presently most commonly regarded as gold. Inflation targeting ancd interest-rate targeting are thus 2 of the primary policy tools of a monetary authoritry; exchange rate targeting is another viable option.

The modern entity’s economic policy is comprised of fiscal policy, monetary policy, and government laws. Fiscal policy generates revenues, and monetary policy acts as the stabilizing force of the economy. The monetary policy is the glue that holds the entity together; when turmoil rears its head, the mechanisms of the monetary policy ostensibly react to steady the economic system. That is, an effective monetary policy will efficiently and effectively neutralize aberrances in the financial markets. It should be noted that autarkic and barter economies do not need monetary policy or a monetary authority, as there is no currency or money circulating and thus no regulation needed for it. Further, both fiscal policy and monetary policy should be derived from government laws. These should be 2 administrative areas of the government that have the ability to make emergency adjustments in times of war and pestilence, but personal intervention by politicians should be uncommon or else we risk life according to personal whims of 'special' individuals. The government should have low volatility to be efficient and consistent; thus, considering the many nuances of economics and money it is utterly asinine for any individual to proclaim to know the 'money.' It will do us all best to set clear rules like we do for everything else when discussing fiat money.

However, an issue arises with the theory of government regulation; how can one regulate themself? We must therefore assume that the government does their best with regulations and laws and that its importance on the economy is negligible. Not to say that government regulation is not important, but that its volatility is low. We know it going to be there and we can’t really change it; monetary theory today conversely supports active management on the fly as new research supports existing financial statement numbers. Government regulation is simply a given and its effects cannot be easily quantified, and so a strict monetary rule will suffice; the diverse nature of politics supports this assumption. Therefore, a primary influence on the economy, in that it is that which is most quantifiable and measurable, must be interest rates.

Monetary policy simply means policy of the money, or maintaining stability or value of the money. Value is derived from stability and confidence. A strict monetary rule and set interest rate standards produce more stability and confidence than active discretion or usurious interest rates. In today’s integrated market, several factors are commonly acknowledged as influencing the value of an economy’s money: exchange rates, interest rates, inflation rates; the exchange rates and inflation rates together can be synonymous with money supply, as money supply targeting affects exchange rates and inflation rates. Thus, any policy aimed at the exchnage rates or inflation rates will undoubtedly influence the other and thus the money supply. Interest rates are not targeted in order to effect the money supply, rather fixed interest rates are another tool, which, along with a monetary rule, consistenly bears economic stability and confidence. That said, what influences each of these factors?

**Table inserted**

*Exchange rates- GDP and money supply*

*Inflation rates- money supply*

*Interest rates- discount rate*

***table inserted***

The money supply clearly has great influence on the value of the money, as our money supply is a requisite, and thus the interest rates may offer the greatest potenetial to increased operating efficiency of a entity’s markets. We can set a fixed monetary rule for annual money supply increases, thus satisfying the growth needs of physical capital and innovagtion; however, interest rates offer other possibilities. The question may be posed, then, of what is the correct manner to manage a market’s interest rates, which form the basis of corporate and individual activity; a suggestion is fixed interest rates of 0% at all levels of the economy in all markets, although given the wide variety of interest rate types there are infinite suggestions about proper fixes, contrasted to monetary stabilisation policy of which passive rule is the clear choice over active discretion. Simply put, there is no 50-50 choice for interest rates, rather there is much to be debated as to proper rate classes.

Some may say that part of living is doing the best research and finding the best deal; interest rates give us the opportunity to prosper from hard work. But how many actually save what they make, or put what they make to good use; most spend it as easily as they were given it, whatever ‘it’ may be. The fact is that financial institutions will use their position to institute usurious rates to increase their financial profits. Human beings are greedy jealous people by nature, we all are. Considering the most powerful position money has in the world, it is best to regulate money very much to ensure it cannot tempt our weknesses at will.

Fiscal policy cannot be ignored however, although its effect is more noticeable on the operating efficiency of the entity, and not the stability of the economic markets in which the entity operates. Essentially, an unsound fiscal policy, either relying too heavily on debt or revenue, will only serve to unseat the particular entity, not its competitors. That said, a particular money can be relatively stable, and yet the market around it cannot be. This results from inefficient fiscal policy. If too many companies fail due to ineffective fiscal policy, then the market will begin to see bends and possible breaks.

The 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.

Several of the roles of money and banking include: banks can lend money up to portion of its reserves, money has value in relation to purchasing power, and money consists of instruments with certain characteristics and is used for simplicity. The bond and stock markets play very crucial liquidity roles in the economy. nterest rate movements play a very critical role in the economy. Lower rates typically stimulate the economy better, yet 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.

There are numerous tools countries can use for economic objective completion today, including:

inflation targeting, interest rate targeting, exchange rate targeting, and fiscal policy—tax laws. To reach these goals macroeconomic indicators such as GDP and poverty, inflation, and unemployment rates are examined. Interest rates and exchange rates can be manipulated by the government via the money supply to sometimes influence these macroeconomic indicators. Four major economic indicators in use in today's economy are: **(1)** GDP **(2)** CPI **(3)** Unemployment Rate **(4)** Poverty Rate.[[3]](#footnote-2)

***GDP: Income***

Gross domestic product (GDP) measures the value of economic activity, and is considered a best indicator of economic health, and is 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 refers to the 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 include: used goods resold is not counted, inventoried goods are counted as expenditures (assuming no spoilage), total value added of all goods; no intermediate sales, imputations: home owners (renting themselves), government services at cost, no imputations for other rents (car, home meals), underground economy.[[4]](#footnote-3) Nominal GDP is the values of goods and services at current prices, and real GDP is the 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.

The GDP deflator, or implicit price deflator, is nominal GDP/real GDP; it reflects what’s happening to overall prices; deflates (takes out inflation) of nominal GDP to get real GDP. Chain-weighting is uesed to calculate base year for real GDP; this bae changes every 5 years, but there is little difference, because prices change slowly over time. The 4 categories of GDP are:

**(1)** Consumption~ C **(2)** Investment~I **(3)** Government Purchases **(4)** Net Exports~NX. Consumption consists of goods and services bought by households, which includes nondurable goods, durable goods, services. Investment consists of goods bought for future use, which includes business fixed investment, residential fixed investment, and inventory investment. Government purchases consists of goods and services bought by local, state, and federal government, including military equipment, highways, and other services from government workers; does not include transfer payments (social security and food stamps). Net exports accounts for trade with other countries. GDP follows a seasonal pattern; it rises at 4th quarter and drops in 1st quarter, and as such, some measures will be seasonally adjusted~~this is primarily due to accounting methods.

 *national income accounts identity- Y (GDP)= C + I + G + NX*

Other income measures include: **(1)** Gross National Product~GNP **(2)** Net National Product~NNP **(3)** National Income~NI **(4)** Personal Income~PI **(5)** Disposable Personal Income~DPI.

Gross national product counts nationals everywhere; GNP is GDP is on domestic soil.

 *GNP= GDP + factor payments from abroad – factor payments to abroad*

Net National Product shows net result of economic activity; consumption of fixed capital (depreciation) is 10% of GNP.

 *NNP= GNP - depreciation*

National income is total income to firms; indirect business taxes (sales taxes) comprise 10% of NNP. There are 5 categories of NI: compensation of employees 70%, proprietor’s income 9%, rental income 2%, corporate profits 12%, net interest 7%.

 *NI= NNP – indirect business taxes*

Personal income is income households and noncorporate businesses receive.

*PI= NI – corporate profits – social insurance contributions – net interest + dividends + government transfers to individuals + personal interest income*

Disposable personal income is found by subtracting personal tax payments and certain nontax payments (parking tickets) from personal income.

 *DPI= PI – personal tax and nontax payments*

***CPI: Inflation***

The consumer price index (CPI) measures the cost of living, or the increase in the overall level of prices, which is also referred to as inflation, and is the most commonly used price measure. 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. The CPI collects prices for different goods and services and assigns them weights based on usage (more frequently used get heavier weights).

There are 3 differences with CPI and GDP deflator: **(1)** the GDP deflator represent's all goods and services, and the CPI respresent's those bought by consumers; purchases by firms and governments do not show up in the CPI **(2)** the GDP deflator only includes domestic goods, while the CPI accounts for foreign purchases **(3)** the CPI is a fixed basket and the GDP is a changing basket. There are 2 primary indexes used: (1) Lasperyres~CPI (2) Paasche~GDP deflator. The Laspeyres index is a CPI price index with a fixed basket; it overstates increases in cost of living by not accounting for substitutes. The Paasche index is a GDP deflatorprice index with a changing basket; it understates cost of living by not accounting for welfare loss from using substitutes. Many things like COLA and social security are based on CPI, as the CPI does not account for changes in quality or new products; it does however overstate inflation by around 1%..

***Unemployment Rate: Joblessness***

The 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. The labour force is the employed and unemployed; not interested workers (disgruntleds, retirees, or students) do not count.

The unemployment rate- *# unemployed / labour force \* 100%.*

The labour-force participation rate- *labour force / adult population \* 100%.*

These are computed for all types of ethnic and sex groups. Okun’s law is a theory that represents the negative relationship between GDP and unemployment rate, that is the higher the GDP the lower the unemployment rate.

% change in real GDP = 3% - 2 \* change in unemployment rate

So no change in unemployment rate should lead to a 3% increase in real GDP.

***Poverty Rate: Wealth***

The poverty rate measures wealth much like the GDP does. However, a major difference between the poverty rate and the GDP is that the poverty rate measures the welfare of the entire society, whereas the GDP can focus on just the richest few. Both are important, as the GDP can indicate total output and such, still the poverty rate indicates how big the gap between rich and poor is in the country.

**1.2 Nature of Money**

Money is a creation of society. In fact, money is the ultimate creation of society: it is intrinsically worthless, yet the most important part of society. Without organised society, there is no need for money. Therefore, money must be viewed as part of society, and must be considered in terms of other creations of society. When we are determining how to best monitor our money, therefore, we must understand that it is only part of life and must be categorised for the intrinsic worthlessness that it carries~~it is a material possession and thus influenced by psychological desires. There must be a straightforward law about its use that reduces the psychological desires acting on money produced by organised society, just as there are laws governing other creations of society such as automobiles and computers. However, given the political nature of money and the fact that even with a stringent law someone must devise the law, the line between active and passive monetary policy remains quite blurred.

Fiat money is intrinsically worthless, and yet every major economy in the world uses a fiat monetary system. A distinction must be made between currency and money. In commodity and representative commodity exchange economies currency becomes the money as well, as each note is backed by intrinsic value; however, when the economy has progreessed to a fiat market, the currency no longer is synonymous with the money. Currency represents the money, and thus in our fractional reserve banking system we only need as much currency as there is money in circulation; if the monetary authority wants to increase the money supply they simply adjust account balances in computers and allow the banks to lend more of the currency they have~~if they run out of currency the central bank prints more and distributes it to the banks. There is no physical exchange of currency when the money supply is altered by the government, just changes in commercial banking reserves which allows banks to adjust the value of loans outstanding.

Money has many intersting economic and political concepts associated with its substance. There is debate as to the commodity nature of money, and whether money should be treated like other traded wares. Some economists have even suggested a system of multiple issuers to encourage more competitive prices for money. The intertemporal relationships between exchange rates, inflation rates, and interest rates raise grave concerns about the money stabilisation policy. Further, as capital is 1 of the primary factors of production, the mobility of money becomes a strong influence on economic and political decision making. Politically speaking, we wonder about the time inconsitency of monetary policy and if the neutrality of money is well-founded. A monetary authority, which is usually controlled by the government, must also be formed to regulate the money supply and maintain the economy at full employment or stable prices.

The central bank has monopoly over the money supply; therefore it can be helpful to analyze the central bank's impact on society by attempting to measure producer surplus, consumer surplus, monopoly power, and other aspects of other monopolies we see. Another question that arises is how exactly to characterize the Fed in proper economic terminology, such as a natural monopoly or not.

***Commodity Value***

A sound monetary policy will utilize the available policy tools to manipulate some aggregate measure of money in order target inflation for its policy objective. The goal of stabilising inflation is an important policy objective, primarily because of the instrinsic nature of fiat money. Fiat money is intrinsically worthless; as such, it becomes very each for fiat currency to depreciate in value. This is due to the fact that fiat money is backed just by the credibility and competence of the issuing monetary authority. An example can clarify this presupposition.

A commodity money of gold has limited integrity issues. It is easy to verify if gold is pure and real, and gold is a limited resource. Trees, however, the primary ingredient in fiat money, are a widely available resource, even for persons other than the monetary authority. Further, it is very difficult to verify the amount of fiat money in circulation at any one time, which is due directly to the fact that trees are such a conspicuous resource. The integrity of fiat money leaves much to be desired.

Fiat money can be printed more easily. Thus, due to the wide availability of fiat money’s primary resource and the policy methods needed to regulate its price, inflation becomes the primary policy objective. The market for money is thus a noncompetitive market, because individual entities, such as the central bank, can affect the price.

Interest rates are very important as well, as they serve as a equilizing tool for the business growth. Fiat economies have the ability to grow exponentially. Whenever wealth is created, consumption, output, and utility all increase in a society. For fiat money, it is very easy to increase wealth. Due to this consequence, interest rates must remain fixed with effective business regulations in order to effectively guide the growth of a fiat monetary economy.

The role of intrinsically valuable resources is still important in a fiat economy. Although a fiat economy has made the decision to redistribute their valuable resources back into their economy for a restricted increase in wealth and a temporary increase in consumption, these resources that had previously served as the foundation of the economy still play a vital role. In case of a collapse of the economy, those with the most of the asset will be in better position.

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, thus money is most efficient. There are however more mediums of exchange in today’s economy than just a single government issued currency, such as credit cards and travelers checks. Technically speaking, 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 central bank, such as M1 and M2.

The central bank monitors the total dollar volume of each of the aggregates over time and attempts to identify its behaviour; it examines these variables are analyzes their relationships with macroeconomic indicator variables~~these relationships are in turn 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 central bank because of its regulatory authority over the banking system and and its monopoly over the currency and money 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 central bank may be able to influence the real economy. The decisions on how to regulate the supply of the monetary aggreagtes are known as the monetary policy decisions of the central bank.

***Money Monopoly~~Perfect Money Competition***

However, another question now arises, Do we in fact only need 1 issuing monetary authority, or could a brand name currency system work for the money industry just like other industries. One may suppose that money is different and is not a traded ware like all the others, but following the evolution of the economy from autarkic to barter to commodity based to fiat money, we can see that money is in fact a common traded good as well, albeit the most important of the lot.

Gresham’s Law says that good money drives out bad money in a 2 currency system. In fact, privately issued fiat currencies were used in 19th century in the US and Scotland (Rolnick and Weber, 1986). Once currency moves from barter to fiat the currency becomes a consumer good, and thus economic pressures begin working on the ware. This means that the rules of competition apply and multiple suppliers means ostensibly more level competition and fairer prices. Therefore, when a fiat currency has only 1 issuer it becomes a monopolistic economy in need of governmental regulation. Multiple currencies competing against each other restores competition to a degree, just like multiple banks, but oligopolsitic economies also need regulation due to absence of perfect competition, so perfect money competition is thus not likely.

In terms of measuring the price of the traded ware 'money', in as much as what is willing to be traded for the currency, the only way to measure a intrinsically worthless fiat currency is against other currencies. Commodity money can be measured against the commodities being traded, but seigniorage makes measuring fiat currency against traded wares undesirable, but can be done by examining the domestic inflation rate. The best way to measure the value of the fiat ware is against other fiat wares, and thus the price being paid by having a fiat currency is foreign inflation as the currency fluctuates in value against international currencies when it changes in value.[[5]](#footnote-4)

Insert graph 1 here~~MC, AR, P, of the money monopolist

The economy could operate with several financial agencies issuing money would have to assimilate together so each country could trade currency with each other—short of smaller functioning economic regions. However, several issues arise with a monetary system with multiple issuers that renders this option quixotic. Inefficiency is the primary issue with multiple issuers, as it becomes

remarably difficult to accurately price each currency against each other, and then to some sort of single national rate for measurement against foreign currencies! This sort of system would cause incredible inefficiencies in a highly integrated global market. Other issues include increased risk of default due to loss of economies of scale and possible redemption difficulty in the event of financial distress.[[6]](#footnote-5)

A monopolist’s AR = P, which is precisely the market demand curve, and one must determine its MR. When the demand curve is downward sloping, P(AR), is greater then MR because all units are sold at the same price. Still MR=MC for profit maximizing output, thus providing the same rules as for perfect competition.

rule of thumb: *P=MC/(1+ (1/Ed))*

This is derived from MC, MR, and elasticity of demand equation that specifies quantity and price outputs, and holds for any firm with monopoly power, where (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. One could 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, and 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, which is not the case with money which is very inelastic.

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. A monopolist may supply several different quantities at the same price.

Taxes affect monopolists differently as well. In competitive markets, the burden is usually split between the consumer and producer, though 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 therefore increase by more than the tax because for the monopoly the relationship between cost and demand depends on the elasticity of demand, which is impossible in a competitive market. If you have multiple plants just make sure MR=MC in each plant at an equal basis.

Pure monopoly is rare. 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. A 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 perfectively competitive firm. For the competitive firm, P=MC; for monopolistic firm, (P) exceeds MC.

The Lerner index of monopoly power is a measure of monopoly power calculated as excess of price over MC as a fraction of price; %, (P) over MC; also = -1/Ed. Monopoly power does not mean high profits however, profit depends on AC.

The true source of monopoly power is from the elasticity of demand. Monopoly power is inversely related to firm’s elasticity of demand, thus the lower the elasticity, the greater the power to markup prices. The 3 factors that determine firm’s elasticity of demand are: (1) elasticity of market demand (2) number of firms in the market (3) interaction among firms.

With the money monopoly, there is only 1 firm, ergo it is a 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 depending on the products and market conditions. As money is a highly inelastic good, people always need it and will do anything to get it, the central bank hence becomes a very powerful monopolist.

The more firms, or monetary authorities there are, the harder it becomes for any 1 entity to affect price significantly. The entity must create barriers to entry, which can be natural or made up, such as: economies of scale, patents, and licenses. The more aggressive the rivalry the higher the elasticity of demand becomes, though with money there is only one supplier and so elasticity remains low.

When there are several firms, or issuers of money, 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, and thus must be considered in a dynamic context.

The money monopolist does not have a traditional pricing strategy though, such as price discrimination, 2-part tariffs, or bundling. Despite that, there is still a form of price discrimination that the central bank uses. By manipulating the money supply the central bank can influence inflation and exchange rates, the sources of domestic and foreign inflation. The price discrimination is not as evident when a passive rule is used, but when active discretionary policy is utilised we see price discrimination.

Price discrimination is setting more than 1 price at a time to different customers. The central bank sets the same price at all times for all customers, but can change that price from period to period to benefit special groups or for macroeconomic or political reasons.

The monetary system would qualify as a monopoly because there is a seller charging prices above MC and there is 1 seller and many buyers. The monopolist is the market and completely controls what is available for sale. It can't charge any price it wants however, as it must analyse the market demand curve. The monetary authority would be a natural monopoly, as it is a firm that can produce the entire output of the market at a cost lower than what would be if there were several firms, thus the central bank enjoys a certain economies of scale.

The aggregate economic efficiency of the a fiat monetary system with a single issuer leads much to be desired, albeit less inefficiency than a system of multiple issuers or a commodity backed system in a highly integrated world economy with computers. Government intervention can actually improve economic inefficiency in a monopoly and eliminate deadweight loss, though not as much perfect competition; the government may still have other objectives other than economic inefficiency that influences their involvement.

As money is a monopolstic industry, we should expect to see some of the welfare and surplus effects that other monopolies observe. There is a distinct producer surplus gain evident. The producer gain in the money case would be the home government, and essentially the citizens of the home country who benefit from the foreign exchange rate advantages.

In terms of costs to society, monopoly and monopsony typically cause production to fall below the competitive level, as there is a deadweight loss of CS and PS. Rent seeking is another social cost, in that the monopoly will spend money in socially unproductive efforts to acquire, maintain, or exercise monopoly power, thus resulting in lobbying and bad investments. The government will usually prevent the firm from acquiring too much monopoly power to reduce social costs though; yet the case remains will the government intervene when the government is the monopolist.

-where is the CS or PS???

CS is the total benefit consumers receive beyond what they pay; how much more they would pay.

PS is difference between market price producer receives and MC of producing the unit.

There is typically a deadweight loss that results from government intervention, which is a net loss shifting surplus from C to P or vice versa.

**Insert graph here-CS and PS of money monopoly**

***Nature of the Monetary Authority***

The monetary authority becomes a very important entity in a fiat economy. Does this monetary authority need to be aligned with governmental interests, or should it be a separate government agency, or a private business all of its own? This becomes perhaps the most important issue when discussing monetary policy, as stabilisation policy directives can have great consequences for disparate fractions of the society.

The monopoly aspects of the monetary authority dictate that caution must exercised by the entity and those who give the entity its power. The monetary authority need not be the one issuing the paper money, but it must the single uniform voice of the country’s monetary policy~~this is similar to outsourcing, whereby people are recruited that are most knowlegable and best at work on the topic.

There must be a distinct separation between the regulatory arm and agency responsible for the physical handling of the money. This is perhaps one of the most vital differences between countries handling of their monetary systems. One commonly sees much more intertwined cooperation in some countries compared to others. The debate as to how close the central bank and the government should be for comfortable effective delivery of the nation's monetary stabilisation policy is of great contention.

***Intertemporal Relationships***

There is a very dynamic intertemporal interaction between interest rates and inflation/deflation rates. Households will rather consume now than in the future, assuming their dollar buys less in the future. When their dollar buys the same, as when interest earned accounts for inflation of the currency and reduction in purchasing power, the household will be indiffernet to consuming now or in the future. When the interest earned will be more than the inflation increase, the household will prefer to consume in the future.

To completely eliminate this cost of holding money intertemporally, and since changes in the money supply are a prime source of inflation, 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.

This penalty can also be reversed by letting interest rates increase the amount of money, which in case the monetary authority still must determine how much extra currency to provide to the financial intermediaries to cover interest increases of the money supply. This is why the central bank can manipulate the money supply with interest rates, although it takes a little longer to work.

**Table here**—policy lags; interest rate changes change the money supply; time it takes other policy tools to change the money supply

***Capital Mobility***

Another intersting feature of money is its mobility. Money is extremely mobile as compared to labour. The primary factors of production are capital, labour, and resources. This means that ostensibly capital becomes less of a hazard than labour and raw materials. A corporation can relocate operations much easier due to capital's mobility, as they can find new labour and raw materials in the new region. They cannot bring their own labour and raw materials with them, they can though it is likely more expensive, yet the corporation can bring their capital with them and simply purchase the new labour source and new raw materials in the new region. Capital can be transferred with a simple press of a button on the computer and be transferred to a new bank in a different country in a matter of seconds.

This speaks to the purely technological aspect of fiat money. Its loss of intrinsic value means that there need not be an actual handling of phsycial goods. There is no value to risk losing in a move; nothing to fear losing in an airplane or ship crash. Therefore, the capital mobility of fiat money in a technological society allows for immediate transfer of funds, whereas immediate transfer of phsycial labour and raw materials is not possible, speaking to the central importance of money.

A competitive factor market is one where there are large suppliers of a factor of production, such as labour or raw materials. The capital factor market is also competitve, as there are many financial institutions willing to lend, but capital is much more mobile than labour or raw materials. In a competitive market, the demand for an input is given by the MR product, the product of a firm's MR, and the marginal input of the product.

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.

An exchange economy is a market in which 2 or more consumers trade 2 or more goods among themselves. An efficient allocation is an allocation of goods in which noone can be made better off unless someone is made worse off.

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.

 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. A derived demand curve- demand for an input that depends on, and is derived from, both the firm’s level of output and the cost if inputs.

-table here- ME and AE ~~factor demand curve for capital

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 is 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 a 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.

-table economic rents of money

Factor markets with monopsony power is 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. A firm should buy to where MRP= ME. A 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.

Factor markets with monopoly power is 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.

Further, capital in different currencies can be obtained in different markets. This leads to monopsony and monopoly power. The different players in the target market must cater to the one corporatin entering the market looking for new currency. There is a monopolistic business needing funds and a monopsonistic market supplying funds.

From that basis we can see that capital is more important than labour and resources for consumption and standard of living—the mobility of capital relative to labour and resources allows dynamic changes in the C and standard of living due to international capital fluctuations. To put it simply, capital is internationally mobile, while labour is not.

***Political Issues~~Time Inconsistency and Neutrality***

Time inconsistency of monetary policy is a when politics change the direction of monetary stabilisation policy. A new regime can implement new monetary policies that run contrary to the prior established policies and which in fact are implemented to aid the new regime.

Neutrality of money assumes monetary policy doesn’t affect real variables such as output and employment; premies of real business cycle theory and most radical assumption probably not true, but no one knows for sure.

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. 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. W**hen 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 decree) monies for barter

Monetary theory is a political process as well (policy) and is hard to quantify. Fiat money is based on confidence, as 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.

The 2 transactions are: (1) currency for goods (2) goods for goods- barter. The 3 economies are: (1) autarky (2) bilateral exchange economy (3) monetary economy.

The 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 equiproortionate 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.

-difference between real and nominal money supply

Monetising the debt is when the Fed buys up securities when the Treasury issues them; this reuslts in rthe Treasury getting their money, interest rates remain low because there arne;t as many on th eopen market, and the money supply increases somewhat (depends in where Treasury spends the money). A major issue when determining the effect on the money supply of government debt is where the funds are going. When the Fed is buying and selling on the open market, if those funds are going to Japan then the world money supply has increased, but the US money supply has not.

Monetary policy goals can be set at anything: the most enduring are stable growth, stable prices, and full employment. Transmission mechanism- the process by which a change in the money supply filters through the economy ancd 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 induces equiproportional changes in nominal variables while leaving the real economy unaffected. Monetary neutrality refers to 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.

***Substitutes~~Complements***

An interesting aspect of money with regard to its economic characteristics deals with its substitutes and complements. We do not have to assume currency instead of money because of the electronic and investment nature of today's markets. Many transactions condcuted in the financial markets today involve investment pursuits, as opposed to immediate consumption motives.

Substitutes for money would include: liquid financial instruments, any collateral, barter, and so on. There are truly infinite substitutes for money, because we all value different possessions differently, and as such whatever one is willing to accept as a substitute can be accepted as a surrogate.

When discussing complements we must assume foreign inflationary pressures. The primary complement for money is pure domestic spending, because as the price of money rises in relation to foreign currencies (home currency depreciates), people holding the home currency will buy fewer imports and increase domestic spending. This can also be characterised as conventional import/export currency appreciation/depreciation theory, yet it also correctly identifies the theoretical complements of money.

**table here**

showing % of

**table here**

***Elasticity of Money***

Money is an inherently elastic good, although not infinitely elastic. This can be understood by examining exchange rates, although technically speaking we must assume currency as the traded good since money is not a real good[[7]](#footnote-6), so in effect the elasticity of money cannot be quantified although the elasticity of currency can be. This is different from substitutes or complements because when we say demand for money, which is what elasticity measures, we assume immediate short-term demand, as opposed to intermediate to long-term investment demand.

We can't categorise money elasticity in terms of domestic inflation either, but we can do so in terms of foreign inflation when we compare currency values. As seen in the graph, as currency costs rise in relation to other currencies (home currency depreciates), companies will attempt to complete business transactions in other currencies and households will travel to other countries with more favourable exchange rates.

**table here**

exchange rates showing inelasticity of money

**table here**

As generally supply and demand are more elastic in the long-term, the short-run and long-run elasticities of currency are likely more elastic in the short-term, as households and firms looking for immediate satisfaction will look elsewhere, but those who have plans important enough to need a certain currency at some point in the future will buy the currency regardless of price.

**1.3 Aggregate Demand~~Supply**

Economists use a theoretical construct, the aggregate market, to think through the actions in an economy. An aggregate market is an approximation to reality. It is a grouping of similar items for which meaningful supply and demand schedules can be obtained, such that an equilbrium price and quantity can be determined: M1, M2, CPI, GDP. GDP deflator

Monetary stabilisation policy relies heavily on the demand and supply forces in the economy. The supply and demand schedules are determined by a variety of factors. Demand changes according to: including disposable income, seasonal fluctuations, and changes in prices and tastes. Supply changes according to: wage rates, capital costs, and prices of raw materials. Excess demand is when the quantity demanded of a good exceeds the quantity supplied, and excess supply is 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.

The aggregate market can then be divided into multiple aggregate markets to analyse: 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 analyse productivity and preference shocks; without such shocks, there would be no business cycle and hence no need for monetary policy.

**table here**

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)

**table here**

**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

***3 Main Groups***

There are 3 main groups whose pursuit leads to optimal decisions that determine the shapes of the supply and demand curves in the markets where the groups interact: (1) households~~(2) firms~~(3) government.

The households' objective is to maximise utility, which is derived from consumption and leisure, and it has 3 primary 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.

***Households***

Households have decisions to make regarding preferences, consumption/savings, portfolio allocation decision, and labour/leisure decision.

Households prefer to be utility maximisers and derive utility from consumption and leisure; they have diminishing marginal utility in consumption and leisure. Households preferences are also stable: any increase in consumtion 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.

Consumption/savings decision depends on relative intensity of household’s preferences for consumption in the current period. Periodically, the household receives real wage income from labour services and real interest income from bonds urchased with savings. A portion of this income is dedicated to consumption and the remainder to future consumption possibilities (savings). The household will typically allocate the same amount of each each period.

Regarding the portfolio allocation decision, the household must maintain a certain quantity of money to meet its planned consumption expenditures while minimising the cost of cash management. There are only 2 financial assets in the small closed economy: money and bonds; savings must be divided between these 2. 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 indusing households to shift wealth from money to bonds.

The labour/leisure decision concerns the role of hosueholds 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 permamently increase productivity of labour; this increases demand for labour and dercreases 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 is associated with higher real wages.

***Firms***

The firms' objective is to maximise profits and it has 2 primary 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.

One 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 imporved 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 dininishing 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, and 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.

Production and labour demand decisions also hamper firms. 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.

The investment and bond supply decision is important as well. 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. The cost of capital, or marginal factor cost, is the interest rate paid on funds raised for invetsment. 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 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.

***Government***

In discussing the government's objectives and decisions, it can be useful to abstract from fiscal policy, as purpose of model is to examine short run effect of monetary policy on economy, in which case government expenditures on goods are 0, no taxes, no bonds; here the government's only role is to supply money. Further, we can assume money is printed and transferred directly to households; this model doesn’t consider financial intermediaries, policy groups within the central bank, and the government securities markets. The government can ostensibly, by altering rate of monetary injections, achieve short-run macroeconomic goals of stable growth (full-employment) and stable prices. Comparative statistics concerns a model allowing examination effects of certain monetary policy decisions on the economy. It starts with equilibrium, then shocks the markets and compares quantities and prices of goods before and after.

The government has a money supply decision to determine. The quantities of money and bonds demanded by households and quantity of bonds issued by firms are measured in relative terms, or 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, MS, 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: MS/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; and increases in the (P) with no increases in the nominal money supply reduce the real money supply.

***General Equilibrium***

General equilibrium occurs when households make consumption/savings, laboour/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; the impact of the shocks must be examined by looking at all other markets. The bond rate represents the price variable in the financial markets; the bond price and bond rate are inversely linked and carry same information; this not useful in monetary policy however as 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 equilbrium 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.

Full employment is 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 yeilds 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 purses short run goals of full employment. It is impossible to measure what full employment is or whether it has been achieved.

***Aggregate Demand***

**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.

The 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. The government purchases multiplier tells how 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)  *DY/DG= 1/(1-MPC)*

Keynesian cross says the government-purchases multiplier is greater than 1.

  *C=C(Y-T)*

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.

 *DY/DT=-MPC/(1-MPC)*

The tax multiplier- amount income changes in response to a $1 decrease in taxes.

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.

**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. The theory of liquidity preference is 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(ray)

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

**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(ray)

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.

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 unanticipated inflation, which generally means from a rising rate of inflation.

**Fiscal Policy Shifts the IS Curve and Changes the Short-Run Equilibrium**

IS-LM is a qualitative model; macroeconometric 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 gretaer spending on goods and services; IS-LM model. Changes in monetary of 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 are: (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.

**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)

***AD in the Open Economy***

**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. The 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, such as Belgium or the Netherlands. The small economy has perfect capital mobility according to the Mundell-Model, and 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.

fiscal policy *Y= C(Y-T) + I(r\*) + G + NX(e)*

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, and the lower the level of income.

monetary policy *M/P=L(r\*,Y)*

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 interets 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.

Small open economy~~ floating exchange rates are the most common in the world today. 3 Policies go into a small open economy with floating exchange rates: (1) Fiscal Policy (2) Monetary Policy (3) Trade 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. An increase in the money supply shifts the LM curve to the right, lowering the exchange rate and raising income. 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.

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. 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. 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

When 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. When 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.

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 acountry, the interest rate in that country may exceed the world interest rate by some risk premium; according to the Mundel-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.

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***

There is always a temporary tradeoff between inflation and unemployment, although 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, the 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. There are 3 theories used to 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, yet 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=Y1 + a(P-PE) a>0

Where, Y is output, Y1 is the natural rate of Y, P is the price level, and PE 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; a indicates how much output responds to unexpected changes in the price level; 1/a 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 are: (1) Sticky-Wage Model (2) Imperfect-Information Model (3) Sticky-Price Model.

Sticky-wage model says that 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. Sticky-wage model makes 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.

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.

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.

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. The 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.

p= pe - b(u-un) + v

Adaptive expectations (pe)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.

The 2 causes of rising and falling inflation are: (1) demand-pull inflation- b(u-un) (2) cost-push inflation- (v). Demand-pull inflation hows 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; b measures how responsive inflation is to cyclical unemployment. Cost-push inflation hows 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. The 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.

The 2 requirements of painless disinflation are: (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. The 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

**1.4 Money Supply~~Demand**

Perhaps one of the most clear influences on money supply and demand schedules is the effect of government intervention and price controls. We have already established that money is by nature the most monopolistic industry in our economy, and as such money receives more government intervnetion and regulation than other wares.

We can see the money creation process due to the entrance of new participants to the market. A new household arrives, and they must exchange their currency for the local currency. This is the only entry point for new fiat currency to be introduced, short of giving it to someone via transfer payments.

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. The 2 types are: (1) portfolio theories (2) transaction theories.

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.

Transaction theories emphasize the role of money as a medium of exchange. They 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.

The 2 classes of money are: (1) those that are a store of value and medium of exchange (currency, checking accounts) and (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 are those nonmomnetary assets that have acquired some of the liquidity of money; the mear existence of complicates monetary policy because they can be easily switched to.

Table

***Methods of Entry***

1. foreign exchange

2. transfer payments to households

3. households via purchases of government securities

A currency is only as inflationarily unstable as the stability of the people using it. Therefore, foreign exchange

When would inflation be recognised? When there are too many dollars chasing too few goods. The prices of goods rise as sellers see an opportunity. When more goods are introduced, the currency will deflate back down to normal levels.

2-3 period lag for prices to rise

2-3 period lag for the sale of government securities for debt to drop prices

2-3 period lag for prices to drop further from increase in goods

**insert table here**

To reduce or increase the money supply however can also be accomplished through buying and selling government securities. The government could sell any assets for cash, yet securities just like the fiat currency they suggest, with 0 intrinsic value, yet have the most liquidity of all.

Printing money

Government has 2 reasons for issuing securities; for debt for bills to run the country, or to manipulate the money supply. The buying of the securities means that more currency is printed. When they are sold it is for debt purposes, so no money is saved

-money is a normal good

**4. Supply of Money**

Discusses the theory known as the theory of transactions demand for money and derives an empircal 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

σ= uncertainty due to business cycle fluctuations; about real income

**β**= conversion costs

r= opportunity costs

P= aggregate price index

Y= GDP

log Md= α0 log β + - α1 log r - α2 log y + α3 log P + α4 log σ

Because good proxies for conversion costs and uncertainty do not exist, can be simplified to:

log Md= α - α1 log r - α2 log y + α3 log P

Setting elasticity of money =1 yields:

log (Md/P)= α - α1 log r + - α2 log y

Log-linear model of the aggregate demand for real money balances (Md/P)

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 factor should be positive or negative; theory is not helpful for statistical estimates however. Issue is that staistical relationships change over time, due to: inflation, regulation, and financial innovations.

Empirical facts- those statistics that have remained unchanged; first empircal 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.

Velocity~~The various measures of money can exhibit long-term trends. 2 Reasons for Long-Term Trends are: (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(Ms/P). When the money market is in equilibrium the money supply = money demand, so demand can be substituted for supply.

2 Empirical Facts are: (1) price elasticity of money is = 1 (2) for most measures of money, the real income elasticity of demand for money, α2, is close to 1.

-Marquis and Witt (1989); Mehra (1992)

V=y(Ms/P)

log V = log y - (Ms/P)

log V = - α0 log β + α1 log r + (1- α2) log y - α4 log σ

From the second empircal fact:

log V = - α0 log β + α1 log r - α4 log σ

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 ( β 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 σ increases, precautionary balances rise and velocity falls.

Velocity is used to identify secular changes in the aggregate demand for real money balances, because: empircal 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 occuring, the velocity of money over time would show a pattrn 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 undestandings are much more important in decision making than M3 and L.

***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 mulitplier 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 fro 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. The 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.

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 though 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 factors 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 = rDDD + rTTD + rEED

-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

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 then 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.

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 arise: (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 decision 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.

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.

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 its 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**

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.

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 arise: (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. The first relationships already derived; second set of derivations consists of M1 and M2 aggregates for NBR and MB.

-equations

-equations

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 central bank needs to know:

1. currency-deposit (c)

2. liquid asset to transaction deposit (a)

3. excess reserves to total reserves (e)

4. required reserves (rD)

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. Week2week 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.

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.

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 fro 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.

The 3 exogenous variables in money supply model that determine money supply are:

(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

A high-powered money is 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.

The 3 instruments of monetary policy are: (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.

Reserve Aggregates~~the central bank can alter the money supply either by changing the reserve requirements directly or by adjusting the totoal volume of reserves in the banking system though 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 relationshops 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 central bank's 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 lareg 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 is 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.

VC = (1-f) TR

Where f is the fraction of total reserves the bank wants to hold at the Central Bank.

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 = rDDD + rTTD + rEED

-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 Central Bank as a matter of policy (2) Central Bank applies administrative pressure in banks it deems to be abusing the privilege; can be effective considering the extensive regulatory authority that would enable the central bank 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 central bank; 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

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 its 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

Reserve Aggregate Multipliers~~The central bank 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 outdstanding 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 analagous to obtaining the multiplier for NBR when banks choose to expand their loan portfolio.

Money Multipliers~~When the central bank 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 arise: (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

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 central bank needs to know are:

1. currency-deposit (c)

2. liquid asset to transaction deposit (a)

3. excess reserves to total reserves (e)

4. required reserves (rD)

Only the required resevres ratio is known, as it is ste 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 attmepts to onitor 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. Week2week periods is when these ratios are most commonly calculated. Even perfect control over 1 or more of gthe 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.

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 liabilites are included in M3, but not all are in M2). Although the Fed could reverse the increase in loanabke funds or deposit base with appropriate open market oeprations, 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.

***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 of theories: (1) portfolio theories (2) transaction theories.

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.

Transaction theories emphaisze 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.

The 2 classes of money are: (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)—nommonetary 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 nonmomnetary 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.

***Households***

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.

The 3 determinants of demand for money are: (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.

2 demands are: (1) Transaction Demand (2) Precautionary Demand.

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 is fraction of income consumed each period. 2 consumption issues are: (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 are: (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.

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.

***Firms***

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.

***Velocity~~Money Demand***

Aggregate money demand function~~several factors influence demand for money. 3 factors affecting average money balances are: (1) scale of overall monetary expenditures during the payment period (2) opportunity cost of holding money (3) transaction costs of conversions from stored income into money.

For the scale of overall monetary expenditures during the payment period, price indexes are used to monitor inflation or deflation; CPI. For the opportunity cost of holding money, interest foregone; will differ for firms and households. For the 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 al 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.

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 Md= a0 log b - a1 log r - a2 log y + a3 log P + a4 log s

Because good proxies for conversion costs and uncertainty do not exist, can be simplified to:

log Md= a - a1 log r - a2 log y + a3 log P

s= uncertainty due to business cycle fluctuations

b= conversion costs

r= opportunity costs

P= aggregate price index

Y= GDP

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 factor 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 (Md/P)= a - a1 log r + - a2 log y

-log-linear model of the aggregate demand for real money balances (Md/P)

Velocity~~the various measures of money can exhibit long-term trends. 2 reasons for long-term trends are: (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(Ms/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, a2, is close to 1

-Marquis and Witt (1989); Mehra (1992)

V=y(Ms/P)

log V = log y - (Ms/P)

log V = - a0 log b + a1 log r + (1- a2) log y - a4 log s

-from the second empirical fact:

log V = - a0 log b + a1 log r - a4 log s

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 (b 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 s 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.

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 Feds 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.

Other velocity measures~~by varying the definition of money, we construct different volatility measures. Income velocity of currency- nominal GDP/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.

**1.5 Policy Implications**

**-why the topic is of interest and how the paper contributes to the literature**

**-summarize what will be done in the paper**

**-why do I care**

The focus of this paper is on financial performance. What is the ideal financial structure for an entity.

Corporations, individuals, and governments alike all have to devise and implement their own monetary plans, subject to the constaints of monetary theory and government inrteraction of monetary policy.

From accepted monetary theory, an optimal monetary policy can then be suggested for different types and size of countries.

**Monetary Economics**

**Monetary Theory**

2.1 Economy Evolution

2.2 Finanacial Intermediation~~Institutions

2.3 Monies of a Modern Fiat Economy

**Monetary Stabilisation Policy**

2.4 Passive Rule

2.5 Active Discretion

2.6 Rule or Discretion?

2.7 General Monetary Stabilisation Policy in the Long-Run

2.8 Active Monetary Stabilisation Policy Tools

2.9 Economic Indicators~~Lags

2.10 Political Issues

2.11 Country Analysis

Monetary economics is state in which goods are reallocated via monetary transactions rather than by barter is in pure exchange economies. Monetary theory becomes a political process when monetary policy is used for stabilisation, thus making it hard to quantify. However, there is a clear distinction between monetary theory and monetary policy. Monetary theory is the study of monetary of economics, while monetary policy is the implementation of monetary theory by governmental entities.

Monetary economics is comprised of monetary theory and monetary policy. Monetary theory deals with issues of constructing the appropriate monetary policy.

Monetary policy can be conducted according to either a rule or by discretion.

Stabilisation Policy~~Equilibrium Analysis

Currency in an Island Economy

Currency, especially fiat currency, is based on confidence, as 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.

Monetary policy is the implementation of monetary theory by governmental entities

-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 purses short run goals of full employment, it is impossible to measure what full employment is or whether it has been acheived

-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 fulfill their functions in the economy as financial intermediaries

Leading indicators are a data series that fluctuates in advance of the economy; forecasting purposes

Macroeconometric 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. The** Lucas critiqueis 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 adpative expectations not rational expectations. There are 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. The historical record should be considered when deciding between active and passive policy: if active has worked, continue with it.

**Monetary Theory**

**2.1 Economy Evolution**

Even though our current financial system can be very complicated due to processes such as financial engineering, the basic tenets of economies remain the same endlessly. The 2 possible transactions are: (1) currency for goods; (2) goods for goods~~barter. The 3 possible economies are: (1) autarky; (2) bilateral exchange economy; (3) monetary economy. When the transactions have becomes predominantly currency for goods, the economy has progressed from a bilateral economy to a monetary system, as money is now being used.

**Insert table here**

Economics is the study of how we interact with others to obtain goods for consumption. The goods could be needed or just wanted, but they must then be valued and then traded. In an autarkic society, there is no need to value or trade wares~~although intrinsic value may still be applied selectively within the household for unforseen circumstances. In order to obtain the value the asset must be priced, and in order to trade the good financial market performance must be evaluated. Those who can most effectively perform these 2 tasks will most prosper in an any trade economy, whether it be a barter or fiat economy. So, there really is little difference between the 2, except for the method of transaction.

Financial performance is: Asset pricing is:

The evolution of the economy from autarkic to monetary can help us to understand the basic forces at work on our fiat money system.

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.

The 4 microeconomic assumptions are: (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. Island economy is an 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.

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 non 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.

Bilateral Exchange~~barter systems under bilateral exchange. The 2 scenarios are: (1) no intermediate trades (2) intermediate trades.

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.

**table**

~~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 19th 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 auctitioneer 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.

**table**

Intermediate Trades~~innovation in trading. High transaction costs and low incidence of clearing the market forced the households to look for alternatives.

**table**

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.

Commodity money is when the economy uses a specific commodity, such as corn, as the defacto trading instrument for all other goods. Members of the society will trade any good for the commodity serving as money, and that 1 commodity can be traded for any other good, but other goods cannot be traded for each other.

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.

Representative commodity money is when the commonly accepted commodity, such as gold, is replaced by paper money because of security and transportation cost issues. Carrying large amounts of gold invites attention and possible theft and is also heavier and more cumbersome than paper money. The paper money can be concealed securely in one's pocket.

Process~~(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.

Fiat Money~~is when the economy decides that their economy is growing faster via technology and human capital than a limited supply of precious money directl redeemable for capital can support. Therefore, the precious commodity must be replaced by an intrinsically worthless fiat monetary system whereby a monetary authority guarantees the value of the currency and regulates the expansion and contraction of the money supply according to established rules. The previously used commodity can be re-introduced into the economy for a temporary increase in consumption and no change in real wealth. Wealth cannot be created purely from fiat money. The money supply cannot create wealth~~it can represent wealth if reserves are discovered and sold or value is added to the society through human capital or technology, but this disputable wealth gain can only realistically by a small increase no where approaching a boom or bust bubble.

Process~~(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.

**insert graph here**

**2.2 Financial Intermediation~~Institutions**

**Financial Intermediation**

Financial intermediation is the process via which money is transferred from net borrowers to net savers.

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.

***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 are: (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.

6 trading frictions are: (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.

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 criteria: (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.

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.

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 are: (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***

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.

2 functions of brokers are: (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

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 are: (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 are: (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.

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.

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 are: (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.

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 are: (1) transaction deposits- demand deposits and other checkable deposits (2) savings deposits- passbook savings and MMDAs (3) time deposits- CDs.

3 primary reserves are: (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 are: (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 are: (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 are: (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.

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 of capital requirements monitoring are: (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.

***Regulation***

**Regulation of Financial Institutions**

**I.  Types of and descriptions**

I. Banks

II. Credit Agencies

III. Investment Houses

IV. Stock Brokerages

V. Insurance

VI. Securities

**II.  Interconnectedness between the groups
III.  Effects of interconnectedness on society**

**IV.**

**V.**

**I. Banking**

The purpose, or mission statement of the bank is to provide monetary safety assurance for their customers and for bill paying purposes in this electronic age.  Any investment trading of derivatives or equities, or other for profit services they generate are financial institution *profit* objectives, in no way affiliated with the stated purpose of the accurate definition of the bank.

Why are ‘banks’ publicly traded

Should simply be federally regulated

Objectives of the Bank

1. earn a profit for shareholders when publicly traded

2.

3.

4.

5.

6.

**2.3 Monies of a Modern Fiat Economy**

**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 macroecnomic variables like GDP and CPI. The incresing use of credit and debit cards and reliance on electronci 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 are 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 nomiinal or current (real) terms) can be strongly influenced by the Fed because of its regulatory authority over the banking system and 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 aggreagtes are known as the monetary policy decisions of the Fed.

3 properties of demand suitability of money are: (1) return (2) risk (3) liquidity.

Table~~M1, M2, M3, L

**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. Traveler’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 monehy supply

**4. Other Checkable Deposits**

-DIDMCA Banking Act 1980 and Garn-St. Germaine allowed for intersting 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 ot 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

**M2**

Broader measure than M1; includes all of M1 (media of exchange), and several highyl liquid, short-term interest-bearing assets. 4 times that of M1; 2 major % fluctuations: 1970s inflation rates and DIDMCA Garn-St. Germaine1980. In the 1960s, the US was still on the gold standard and their 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. Iinterest-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 wer enon-negotiable and tied up money longer. 1970s inflation hit 14% and houdeholds 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 issued for the Feds monetary policy; all the new deregulations and new monetary aggregates created definition problems for the Fed and they didn’t know how much each njew category should be growing by now. The success of the MMMFs created erratic movements in the volume of the earlier moentary 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, legalisatin of MMDAs did not entirely reverse disintermediatoon, 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 over night 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 containg M3 and L short-term liquid assets. Big reason for their success was the Fed’s high inflation and low interest rate policy. Disintermediation is when funds withdrawn from banks and S&Ls and placed in higher interest MMFs; occurred in the 1970s, and laid the groundwork for the S&L crisis and waekened thebanking 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 principla soruces 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

**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

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.

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 tyring 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).

An important issue is the inclusion of the underground economy; many say it is impossible to calculate in; many religious people have antiquated views of why it should not be figured in

MMDAs and MMMFs created substantial issued for the Feds monetary policy; all the new deregulations and new monetary aggregates created definition problems for the Fed and they didn’t know how much each njew category should be growing by now. The success of the MMMFs created erratic movements in the volume of the earlier moentary 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, legalisatin of MMDAs did not entirely reverse disintermediatoon, 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.

M1 and M2 are the 2 primary concerns of monetary policy. This graph shows their relative weights and importance. volatility~~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 macroecnomic variables like GDP and CPI. The incresing use of credit and debit cards and reliance on electronci 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.

Traveler’s checks are 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 monehy supply.

Privately issued fiat currencies were used in 19th century in the US and Scotland; Rolnick and Weber (1986).

**Monetary Stabilisation Policy**

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 minmise 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.

The best policy is a CGR rule.

**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 fo 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 authoirty 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.

3 steps to defining policy objectives are: (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 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 rised 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 indexc 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 ibjective 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.

**2.4 Passive Rule**

**Monetary Rule**

constant growth (technology, labour supply,/persons)

resources growth is not constant~~requires immediate 1 time increase in wealth

money supply not permanent like people and technology~~when those 2 fall, whole society does too

-this keeps IR rates constant £'s~~Short term, IT, Long term

-when offshore is introduced, must institute caps to account for BOP differences year to year; even if BOP is more or less, do not go beyond cap to prevent too much fluctuation

-innovation not technology~~labour is easiest to predict growth rate, innovation is very hard year to year because of computers~~resources for instant and one-time wealth increase is difficult too

-computers (innovation) have increased wealth much lately as more borrowers can find more lenders at different rates

Once an economy has embraced fiat money as their currency stabilisation policy must be implemented by some agency. Even with multiple currencies in a competitive money market, a single monetary authority must administer the stabilisation policy; thus, stabilisation policy becomes easier with only 1 currency.

The monetarists’ arguement 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 what 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 fo have sufficiently reliable information, but this approach is also imperfect. Better to use a monetary rule instead of fine tuning.

The stabilisation policy can be either active or passive. The central debate of stabilisation policy is whether the economy is inherently stable or unstable—following, is whether an active or passive stabilisation policy would work. 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.

An inside lag is 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. An outside lag is 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 are 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.

**Insert tables here**

The second topic of debate is whether policy should be by discretion or rule. It 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 canot 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 politicans will yield the need for policy by rule; also are simple partisan differences between politicans. 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, the 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 (3) inflation targeting.

Monetarists Rules~~Monetarists advocate the Fed keep the money suppyly 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

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.

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.

**insert graphs 2 here—policy rules**

**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 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. Empircal 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 fne 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 anouncement 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.

**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 orginate 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.

**CGR Rule in the Long-Run**

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 quartely growth rates for 7 or 8 years past, or an equation could be developed to determine when to update money rules.

y(t) = © w y(t-i)

V(t) = © 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.

**2.5 Active Discretion**

***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 prsist 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?

Intratemporal 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 3rd 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 (inflation and exchange rates)~~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.

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 implemenation 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*

***Limkage 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

**Strategies**

**1. Exchange rate targeting**

-already does with open market operations, kind of

-these actions are more to stimulate the economy than improve the US dollar

But what is the proper range for the home currency? This depends on several country specific factors:

**2. Interest rate targeting**

-already done with the Fed Funds rate, short-term interest rate

-but what is the fed funds rate really doing; analyze impacts on short and long term interest rates via Fed Funds rate decision reports;

**3. Inflation targeting**

1. public announcement of medium-term numerical targets for inflation

2. an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are suborinated

3. an information-inclusive strategy in which many variables, not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments

4. increased transparency of the monetary-policy strategy through communication with the public and the markets about the plan

5. increased accountability of the central bank for attaining its inflation objectives

-inflation and exchange rate targeting is money supply targeting

**Intermediate Active Monetary Stabilisation Policy**

Optimal Targeting and the Response of Financial Markets

**Stabilisation Policy and the Choice of an Intermediate Target**

Monetary policy is assumed to bring about the money suply 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, disocunt 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 macreconomic 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 theh 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 informaion 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 numercial 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 relatonships 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 nay be preferred (nominal target used to achieve a nominal objective).

**Active Stabilisation Policy in the Long-Run**

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 mjust 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 reducs volatility in the overlal 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; monetarist 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 investm,ent, 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.

**2.6 Rule or Discretion?**

**Monetarists**

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 ovr 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 anandoned.

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 favorably affected). Active stabilisation policy requires the monetary authority to monitor and design monetary policies, which requires an xtraordinary 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 shcools 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 stabillisation policy to smooth out business cycles may not be proper; if the economy fixes itself, there is no need for it (especially when the tme 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. 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.

The 2 causes of discrepancy are: (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 oeprational definition is open to intrepretation—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.

**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 buy 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 repsond 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, 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.

**2.7 General Monetary Stabilisation Policy in the Long-Run**

**Monetary Stabilisation Policy with Fixed Prices to Consumers**

Prevailing desires of households and firms may dictate the government's next steps.

long-term externalities

1. fixed prices

2. long-term nominal wage contracts

long-term fixed material prices

Price Setting by Firms~~the model presented assumes that the economy adjusts rapidly to full employment, and that a monetary policy response to the 2nd objective can exist without comprimising 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 postively 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 higer 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 wilingness 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

Liquidity-Constrained Households~~The household otsensibly 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 expednitures 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.

Equilibrium Response Without Monetary Accommodation in the Absence of Preference Shocks~~

Economy receives a permanent shock before 1st 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 weal output subsides and the economy adjusts back to full employment; they fal to reflect the fact that th emonetary 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.

Equilibrium Response With Monetary Accommodation in the Absence of Preference Shocks~~The household’s liquidty 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.

Monetary Policy and the Signal Extraction Problem ~~In actual economies, when the monetary authority makes a policy decisions, it is based on information collected froma 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 repsonses 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 surverys are good ways.

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 prefernece 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.

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 wll be made.

**Monetary Stabilisation Policy with Fixed Prices for Producers**

Prevailing desires of households and firms may dictate the government's next steps.

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 ulitmately 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 precommittment 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 factours 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 contractural 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).

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 intitial 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 is the exact same way when nominal wages are sticky as when they are flexible; the contract adjusts at the end of the period.

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 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.

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 traditonalyl 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 householdas are heterogenous; different households have different utility needs and haves; 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.

Response of the Economy to a Long-Lived Intratemporal 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.

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.

**2.8 Active Monetary Stabilisation Policy Tools**

Other tools can be used too, such an unemployment rate targeting, GDP targeting, or misery index targeting, but these 3 are the most logical.

Active discretionary policy requires first setting the target and then utilising the appropriate tools.

**Strategies**

**1. Exchange rate targeting**

-already does with open market operations, kind of

-these actions are more to stimulate the economy than improve the US dollar

But what is the proper range for the home currency? This depends on several country specific factors:

**2. Interest rate targeting**

-already done with the Fed Funds rate, short-term interest rate

-but what is the fed funds rate really doing; analyze impacts on short and long term interest rates via Fed Funds rate decision reports;

**3. Inflation targeting**

1. public announcement of medium-term numerical targets for inflation

2. an institutional commitment to price stability as the primary goal of monetary policy, to which other goals are suborinated

3. an information-inclusive strategy in which many variables, not just monetary aggregates or the exchange rate, are used for deciding the setting of policy instruments

4. increased transparency of the monetary-policy strategy through communication with the public and the markets about the plan

5. increased accountability of the central bank for attaining its inflation objectives

As with other countries, the US does not perfectly control the volume of nonborrowed reserves in the banking system or the value places 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 poliy 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.

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.

The Federal Reserve has three primary monetary tools it uses to influence monetary policy.

**Monetary Policy Tools**

The Federal Reserve uses these three tools to influence the demand for, and supply of, balances that depository institutions hold at Federal Reserve Banks, thus altering the federal funds rate. One key feature of the US banking system is that depository members must maintain a certain percentage of their reserves at al times. When a member bank is short of their required reserves for the day, they must borrow the money from other depository institutions to make up the difference; the interest rate member banks charge each other for overnight loans is the federal funds rate. The federal funds rate is important because changes in it, even small ones, can cause other rates and measures to fluctuate, including: short-term interest rates; foreign exchange rates; long-term interest rates; the amount of money and credit; and ultimately economic variables such as employment, output, and prices of goods and services.

**Open Market Operations**

The primary policy tool used by banks today is open market operations. 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.

Buying gold can be an example of an open market operations. **W**hen 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 trasnactions, 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 decision 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 trasnactions 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 prics and is willing to buy or sell any time; very low spread for the dealers of government securities; low deafult risk.

Can be either secondary or primary govrnment 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 continuosly mointor so they can act quickly if they have to and to maintain integrity in the system and to look for best deals; ususally multiple GSDs are needed.

Relationship Between Open Market Operations and Total Bank Reserves~~Many of the transactions are done electroncially 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.

**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 usualy 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 generaly 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 thebanking 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 mrginal (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 overutilise 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 relsies 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 rot 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.

**Reserve requirements**

Any excess reserves represent inefficiencies to the economy; this is weath that is not being consumed; inefficiency in the intertemporal allocation of resources associated with matching borrowers and lenders. **T**he 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 commecial 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 are: (1) changes in houdeholds’ 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 resevres 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; chaging 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 resevre 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 unneccessary welcfare losses due to greater inefficiencies in the loan market.

Reserve tax is 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 are: (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 commerical 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 federla 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.

**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 onitoring 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 influence monitoring are: (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 innefficiencies in the laon market; the inefficiencies lead to welfare losses due to the reduction in the overall volume of intertemporal trades being intermediated.

**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 volatiltiy 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 aveneue 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 repsective 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.

**2.9 Economic Indicators~~Lags**

-shocks and preferences???

**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

**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 are: (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.

**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 Reserev 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.

**Dynamic Response of the Economy to a Change in Monetary Policy Lag**

2 main questions are: (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 compatabilities.

For exposition, it is useful to characterise moentary 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 litle consequence—changes in excess reserves are assumed to be quickly absorbed by the the federal funda 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 are: (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.

**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.

**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 arfe 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 equilibrum level and then subsequently falls below its long-run equilibrum level. When supernutrality 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 relatin 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 staistical evidence on the duration of the nominal income effect as ranging from 3 to 9 months; unpredictable the exact date; they interpret the staistical 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 welath 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 predicitng 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 unitended effects on the economy.

**Lags and Stabilisation Policy**

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 polciy 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 corective 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 approriately 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.

**2.10 Political Issues**

~~other political issues~~

The basics of monetary policy can be easily summed up as either contractionary or expansionary. The available financial instruments for use by individuals and corporations and the taxation laws governing them will, in conjunction with the value of the domestic currency, determine the direction of said policy.

**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 Opyions***

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 inflaton target—the closer the inflation rate was to the target, the higher the woulod 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 enforcable 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, optimaly 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 punishmentthat the enofrcement 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 advserse 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 fulfill 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 eould 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 perferences 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 as 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 fulfill.

**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 commtting 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 govrnment 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 competitve 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 committ 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 selction of an optimal monetary policy depands on those expectations. These commitments by firms and houseohlds 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.

**2.11 Country Analysis**

**Fractional Reserve Banking**

Paper money began when 16th century in Europe bankers began issuing notes, or receipts in exchange for gold. This was safer and more efficient for larger transactions; thus fractional reserve banking was born.

Goldsmiths stored gold coins for their customer for a fee, and issued receipts in exchange. These receipts entitled the person to immediately origin of bank notes. Then this process was taken 1 step further, and the goldsmiths began printing more notes than gold they actually had, thus increasing their profits. No longer 1 to 1 ratio of paper to gold, could be 2 to 3; bankers are no longer storing or warehousing gold for a fee. They are artificially inflating the money supply, and loaning out the phony receipts at interest; this system became known as fractional reserve banking; this system was transferred to the US. Not allowed in any other business; this is why financial firms fail; banks have been able to get away with it. Alexander Hamilton favored the central bank; he saw it as a symbol of power for the government; thomas jefferson rejected it; andrew jackson killed the next bank. Gold standard introduced in 1834, money of the people, could be inflated or tampered witrh sending government expenditures skyrocketing. Abraham lincoln needed money for the Civil War, printed greenbaks, not redeemable in gold.

1879 went back on gold standard, and high growth and prosperity; growth at 4% per year. 1896 Morgan and Rockefellar wanted a central bank for cheap credit and inflated money supply to fuel the expansion of their business empires; so this was sold to the American Public as a greater elasticity of their money. Many banks failed in 1907, and a lender of last resort was needed

1913 War War I- 3rd Central Bank- Wilson, progressive era, government expansion, special interest deals. Roaring 20s; inflation was hid from economists; 1929 crash lost 1/3 of stock value; speculators defaulted on bank loans and banks in turn defaulted on their demand deposits.

Bretton-Woods met after World War II. US dollar was redeemable in gold, but only by foreign governments; all other currencies were redeemable for US gold. Vietnam- print more money to not raise taxes; 1971; foreigners began redeeming US dolars for gold, Nixon stopped redeeming gold; now floats among dollars. FDIC holds .5% of all reserves it insured; so we depend on the Fed to step in and print money when we need it.

Danger of bankrputcy is what makes banks adhere to sound policies; other organizations are not guaranteed not to fail. wars are the reason for leaving the gold standard. Increasing the money suply (fiat money) is an alternative to taxes; negative effects don’t present themselves until years later, when they can be blamed on the weather or certain businesses or speculators. 10% of demand deposits. Inverted pyramid scheme; $100 in gold results in $10,000 in fractional reserve loans. Driving down interest rates creates investment boom, and which can lead to great crashes.

Now everyone watches the Fed; what will they do next; reforms were suggested, but Clinton and Greenspan rejected them, saying more visibility would be a threat to national monetary policy

**Federal Reserve**

Fed’s mission has been to control the quantity of credit in the economy

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 relationship between the Federal Reserve and the Treasury Departmnet allows for some interesting business dealings. As the Fed is a private institution, although government regulated, they can engage in operations independent of the government run Treasury Department. For example, the reasury issues new securities, the Fed can buy more in the open market, thereby inflating the price of the securities; however, as ong as the Fed is still making a profit, all is well and the Treasury can now essentially set its price for its own securities. However, this is done rather surrptitiously, as the general pubic pays little attention to the activities of these two entities.

One key feature of effectively establishing a country’s monetary policy is the establishment of a powerful, independent, central bank. In the US this is the Federal Reserve. The Federal Reserve is run by two groups: (**1)** The Board of Governors of the Federal Reserve System- responsible for the discount rate and reserve requirements (**2)** Federal Open Market Committee (FOMC)- responsible for open market operations

1) Board of Governors

**2) Federal Open Market Committee**- The Federal Open Market Committee (FOMC) consists of 12 members: the seven members of the Board of Governors of the Federal Reserve System; the president of the Federal Reserve Bank of New York; and four of the remaining 11 reserve bank presidents, who serve one-year terms on a rotating basis. The rotating seats are filled from the following four groups of Banks, one Bank president from each group: Boston, Philadelphia, and Richmond; Cleveland and Chicago; Atlanta, St. Louis, and Dallas; and Minneapolis, Kansas City, and San Francisco. Nonvoting Reserve Bank presidents attend the meetings of the Committee, participate in the discussions, and contribute to the Committee's assessment of the economy and policy options.

The FOMC schedules eight meetings per year, during which the Committee reviews economic and financial conditions, determines the appropriate stance of monetary policy, and assesses the risks to its long-term goals of price stability and sustainable economic growth.

**The Federal Reserve’s mission**

The goal of any economy is growth and survival. The Federal Reserve Act states that the goal of the FOMC is “to promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates.”

The fourth branch?

How is it able to function

**What is the current policy?**

Monetary policy has to be centrally expansionary. The nature of financial markets is to grow through expansion, not die through contraction. However, discretion, as always is important in moderating the expansion to a modest rate. If expansion occurs too rapidly, collapse will inevitably follow.

**Expansionary**

Expansionary monetary supply leads to higher national income.

Expansionary monetary policy leads to lower interest rates.

**Contractionary**

**Federal Reserve’s Balance Sheet**

A 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 Federa 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; cahs 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 then 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.

**Daily Operations at the Fed**

Desk Operations and the Repo Market for Treasuries is a lot of what happens on a daily basis at the Fed's operations.

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 fulfill 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 lqiuid 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, inluding interets paymenty, to the mutual fund.

Transaction costs are very low because of the automation in the process; government securites 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 bankrputcy 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.

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 resevres available for lending). Mutual fund custodial business is highly concentrated within the banking industry; State Street Bank Boston holds tha 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.

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 th 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.

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 are: (1) check clearing (2) transfer of federal reserves from a bank that has excess reserves to a bank that is reserve deficient. Check clearing ncreases and decreases bank reserves, so total reserves are unaffected, as bank deposits at the federal reserve constitute a major proportion of total bank reserves. 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 caled matched sale-purchases MSPs, and are another way of negotiating a (reverse) repurchase agreement in which the Fed is temproarily 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 tansferred 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 gthe fed funds rate falls. RPs are when the person trade securities for cash; reverse RP is when the person trades cash for the security.

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 an dlow default risk; reverse RPs are even less risky, because they are collaterlaised by the securities; therefore, the RP rate is sometimes a few basis points below the federal funds rate. If the federal funda 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 aong 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; commercvial 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.

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 rapdly, 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 are: (1) Outright Purchases- outrights (2) Rps (3) MSPs. Outright purchases are permanent additions to the portfolio; can still be sold, but are not temporary in nature like RPs and MSPs; they are relatively infrequent, 4 to 8 per year—consequently, RPs and MSPs are needed to bring the System Portfolio into balance.

There is a step-like progression, as outright purchases are made and then the temporary tramsactions even out the smaller inconsistencies. Temporary’s are usually preferred to a series of outrights, 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.

**USA Monetary Stabilisation Policy History**

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 naton’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 in 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, uness there were changes in either the currency-deposit ratio or the ratios of deposit accounts with different (positive) reserve requirements; esseentially, 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 resevres; 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 were: (1) no formal mechanism to control prices

(2) inelastic response of the supply of reserves to business-cycle and seasonal fluctuations in money demand. No formal mechanism to control prices meant gold prices were fixed to toehr commodities, so new gold supplies or resevres would affect prices of other commodity goods, and hence the price level; conn ection between bank reserves, money supply reserve, and price level was not understood until after WWI. Inelastic response of the supply of reserves to business-cycle and seasonal fluctuations in money demand meant 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 elastiticty during this period.

Endogenous Money Supply~~Fed act 1913 established 12 regional autonomous banks governed by a central Federal Reserev 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 thmselves 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 were: (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 ineastic money supply. Commercial paper is an important indicator of business cycles, as its need flucuates with business activity; therefore, it is an important economic indicator, and thus can be used as an endogenous money supply deteriminant. 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.

Unintended Consequences of Open Market Operations: 1917-1921~~Fed was envisoned 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 goalm 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 memebr 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 were: (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 elasticty of money supply was based on the premise that the the Fed was intended to provide elasticty of the money supply; as business activty increased, commercial banks would simply discount more commercial paper via the the elastic response of central bank reserves; government debt was thought to interfere with this natural process; therefore, the soluation to inflation was thought to be purging the government debt from the portfolios of the commercial banks and the Fed, and shitfing 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.

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 ecommitte to investigate, Council of Governors, which in turn established another committee Open Market Investment Committee to specifically conduct open market oeprations; 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 10th 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, althoug not instantaneously. In the 10th 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 esigned 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 inetrnal dissension led to substantiual 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 infleunce of open maket 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 were: (1) desire to stem speculation in the securities markets; excessive specualtion 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) departture 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 drmatic 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 ws 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 Reserev 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; pen 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 adminsistration 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 unform 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 oeprations of thre 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 bankign concerns and toward ensuring safety and soundness of nation’s banking system as a whole.

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 ometary 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 were: (1) failure of the Fed to mitigate the 1930 business-cycle contraction, which led to the Great Depression (2) Keynsian economics- fiscal policy more important than monetaery policy (3) no strong leadership aftr Strong; indecison and drift that affected offical 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 be 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 were: (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. 17th 1934 for 20.67 per ounce; gold was selling at 33 per ounce on that date; private holdings were limited to small amlounts 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 saber-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 punce; 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 abonded 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 resevres; thus, the Treasury was acting as the nation’s monetary authority.

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. It 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 slcak loan demand and feared banks would begin promoting speculative loans; recent issues were still on the mind; against the recent backdrop, these large resevres were seen as potnetially dangerous and warrnated 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 th excess liquidity that effectively doubled the reserve requirements; the policies were so severe that they indiced an outright contraction in the volume of money and credit in the economy and precipitated the recession of 1937-1938; simialr 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 reates during this period, so commercial banks reduced their reliance on it.

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 invetsment climate; the Treasury did not sterilise these purchases, which caused a large increase in the domstic money supply and subsequently in the price level. After entering the war in 1941, the Treasury issued moe 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 reluctanctly agreed by the Treasury, to whom the interest payments and excess profits were remitted to by the Fed; gold inflows slowed, but the money supply continued climbing as the Fed’s open market oprations 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-wat price surges by consumers, reflected by a sharp increase in the deposit/currency ratio, which had a multiplier effect on the money stock.

Treasury-Federal Reserve Accord: Truce and Settlement, 1945-1952~~US government bond price support continued after WWII; was a source of ebate 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 specualtive boom; these conditions eventually led to the Treasury-Federal Reserve Accord 1951 where the Fed was releived 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 offical concern with credit policy as its monetary policy; ever since the 10th 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 acheiving those goals were left to the discretion of the policy makers at the Fed and hence susceptible to Treasury influence; the Fed had been restablished as the monetary authority however.

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 variuos 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 reuslts in rthe Treasury getting their money, interest rates remain low because there arne;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 in 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 adminsitration. 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 bansk were issuing fiat money; there was no longer an anchor for the intrnational monetary system.

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 is an 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 empoyment act 1978- stated explicitlty 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 forst 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; buy 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).

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 are: (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 exchangel any private bank wanting to issue private currency had to pay a tax of 200%; they were taxed out of existence.

In the 1960s, the US was still on the gold standard and their 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.

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 containg 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 MMFs; occurred in the 1970s, and laid the groundwork for the S&L crisis and waekened thebanking 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 of DIDMCA are: (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. 1970s inflation hit 14% and houdeholds 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.

**Money Velocity in USA~~Active Discretionary Target Selection**

Money velocity is important because it determines many things about money; useful indicator for target selection.

-what other measures could be good for target selection???

-include in active discretionary section about using measures like velocity to determine if the aggregates being used for targets are in fact good

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 moentary growth consistent with its policy goals, and the policy goals reflectthe 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 unduely 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 is 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.

Monetary Aggregate Targeting and the Response of the Financial Markets to the Weekly Money Supply Announcements~~By 1979, inflaiton in the US had reached double digits, aqnd 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 monehy supply, with particular focus on M1; the implication was that the target cones the Fecd 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.

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 vailidity 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.

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 lessesn 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 are: (1) interest elasticity of M2 is substantially lower than M1 (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. 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.

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 resulitng in double-digit inflation leading many to question whether the Fed can effectively target interest rates.

While the Bretton Woods agreements were in place from WWII to 1971, US had representative commodity money.

DIDMCA Banking Act 1980 and Garn-St. Germaine allowed for intersting 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 ot 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.

***M1 Velocity***

Secular changes in demand for M1~~3 major periods of M1 velocity. 3 periods of velocity of M1 since 1961 are: (1) 1959-1973 (2) 1973-1980 (3) 1980-1994.

(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.

The 3 reasons for volatility during early period 3 are: (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.

***M2 Velocity***

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 unexpectaedly, as occurred in 1973 and 1980 in the demand for M1. The changes in fund transfers in these periods, 1973-1980 anf 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 countercyclicl policy), it is unlikely to be successful relying exclusively on M2 for policy objectives. As a general rule, M2 has replaced M1 as the Feds 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 continula increase in M2 velocity since 1991. The increase in the demand for currency has also been attributed to the underground economy.

Other Velocity Measures~~By varying the definition of money, we construct different volatility measures. Income velocity of currency- nominal GDP/nominal supply of currency. By studying the velocities of different mreaures, we can find the best measure of unti fo rmonetary policy. Velocity of currency has folowed same path as M1, and M3 and L have simialr abrupt changes. Old M1 follows M2; old M1 is currency plus demand deposits; but also shows same short-term volatility issues.

**Regulations**

**Criminal Statutes**

Other laws in this area include the following:

**Financial Services**

Racketeer Influenced and Corrupt Organizations Act

Foreign Corrupt Practices Act

Sarbanes-Oxley Act

Federal Computer Intrusions Laws that includes Homeland Security

Computer Fraud and Abuse Act

Electronic Communications Privacy Act

United States Communications Assistance for Law Enforcement Act

Economic and Protection of Proprietary Information Act

Health Insurance Portability and Accountability Act

National Information Infrastructure Protection Act

Cyber Security Enhancement Act

**Financial Regulation Statutes**

Banking and Financial Services Act of 1999

**Exchange Rates**

strong v. weak currency; 1 has to be better

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 currnecy experience a recession, there is little they can do to combat with monetary policy, as the central bank controls the monetary policy.

EU disadvantages are: (1) low labour mobility (2) no fiscal policy. EU advantages are: (1) traveling and international trade (2) political advantage of connection between countries; wars and trade.

With fixed exchange rates pegged to another unit, the bank must hald sufficient reserves of that unit. Speculative attack is 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 currecy 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 lose of pride with using another government’s currency; this could reduces by using animals.

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 eaqch 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

**Interest Rates**

Interest rates have been regulated before in monetary policy. They dictate the stage of the business cycle; high rates mean business is growing, and low rates mean growth is stagnant. Therefore, regulating them at stable levels should help to regulate the expansions and contractions of output to moderate levels.

Many central banks have used fixed interest rates before, but their uses has declined as macroeconomic fluctuations suggested other measures may be appropriate. It is hard to pinpoint exactly which macroeconomic variables influence others, and as such if fixed interest rates were currently used, if they would have any different impact than other monetary policy tools. Fixed interest rates have been used before, and are known to have been used as moderators of business activity. …US example

2 IR Determinants

1. foreign demand for assets

2. money supply

**2.1 History of Interest Rates**

**2.2 Nature of Interest Rates**

Many different aspects of the world directly affect our ways of life, some more than others. The financial markets are perhaps one of the biggest influences on lifestyle, along with government type and religion, among many others. As such, even though a thorough quantitative analysis of the world economy would prove a daunting task, aspects of the financial markets can be quantified, as the inherent figure-based nature of economics lends itself to concrete numbers, rather than ideological stance.

Interest income represents the primary source of revenue for financial institutions. The financial institutions, such as banks, form the backbone of the economic market which impacts out daily lives. As such, detailed analyses of interest rates will provide the most productive

This suggests that interest rates should be somewhat monitored by the home government, and financial performance should be reduced in importance for effective operation of financial institutions. This does not mean the financial services industry cannot be concerned with profits, as distinctive competencies can exist, but that the primary of goal

 Interest rates influence the availability of credit, along with borrowing criteria,

**2.3 Rates**

Interest rates should be fixed.

Interest rates should be fixed at 0%. This would be most appropriate for equal balance in the economy, and the primary goal of business of maximizing social welfare. This is true because people don’t save anyways, they just spend more when they get more. They may save for a time but ultimately just spend more. 0% interest rates then discourages unscrupulous persons from engaging in dangerous financial activities.

Rates should be fixed at 3% and 7%.

**2.4 Types of**

-categorization of interest rate. sMany different types of interest rate

(Goodfriend, 1998) The term structure of interest rates can play an important role in the making of monetary policy. The degree of restraint transmitted by policy is difficult to manage in a transition between high- and low-inflation regimes. Some points about the use of the term structure for making tactical policy decisions are worth reiterating: 1. the need for policy to preempt a rise in inflation and inflation expectations puts a premium on the long bond rate as an indicator of credibility for low inflation, 2. policy leverage on long rates is regime dependent and will vary with a central bank's commitment to price stability and its credibility for low inflation, 3. policy often follows long rates because long rates embody expectations of future short rate policy actions and because long rate movements often signal changing inflation expectations that may precipitate a policy reaction, 4. bond market vigilantes do not make central banks irrelevant, and 5. the yield curve can be employed usefully to distinguish policy actions from policy impulses in order to tell how much policy is in the pipeline.

(Balduzzi, etc. 1998) A feature of US monetary policy has been active targeting of overnight fed funds rates. A study shows that during a period of tight targeting (1989-1996) term fed funds spreads from the target displayed pronounced volatility and persistence, which increase with the maturity of the loan. It shows that the increase in persistence is consistent with a model of infrequent, but predictable revisions of the target. In the model, the (autoco-)variance of the spreads of term fed funds rates from the target increases with maturity because longer-term rates reflect persistent expectations of the next target change.

(Mehra, 1996) A study empirically investigates the immediate, near-term, and long-run effects of monetary policy on the bond rate. The federal funds rate is used as a measure of monetary policy, and the long run is viewed as the period during which trend relationships emerge. Results indicate that the long-run effect of monetary policy on the bond rate occurs primarily through the inflation channel. However, in the short run, monetary policy also affects the bond rate by altering its expected real rate component. The short-run stance of monetary policy is measured by the spread between the funds rate and the ongoing trend rate of inflation. Results show that the near-term effect of the funds rate spread on the bond rate has increased considerably since 1979. This increase in the short-run sensitivity of the bond rate to monetary policy actions is consistent with the way the Fed has conducted its monetary policy since 1979.

(Christiano, 1996) An analysis of the macroeconomic effects of a monetary policy shock is presented. The study was used to illustrate the role of identifying assumptions and how, in practice, one can test those identifying assumptions. The results indicate that contractionary monetary policy actions do not produce an immediate fall in interest rates, as the initial monetized real business cycle models predict. The point estimates suggest that, instead, interest rates rise for about a year after a typical monetary contraction. They also indicate that output, employment, prices, retail sales, and profits fall, while inventories and unemployment rise.

(Edelberg, Marshall: 1996) Edleberg and Marshall show that exogenous shocks to monetary policy strongly affect short-term interest rates but have little or no effect on longer-term interest rates.

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, invstors will switch their money until an equilibrium is reached. 3 main influences on term return differences are: (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.

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 are: (1) upward- short-term rates expetced 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.

Liquidity Premium~~Liquidty premium has an effect on the normal shape of the yield curve that derives from the pure expectattions 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.

4 alternative yield curve slopes with liquidity premium are: (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 failry 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 wirth distant maturities is 0.

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.

**Inflation Rates**

There is a direct link between money and inflation, and the quantity theory shows this.

Quantity Theory of Money~~shows how increases in the money supply lead to increases in inflation. 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; 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 are: (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.

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.

Inflation and Interest Rates~~Nominal interest rate is the sum of the real interest rate and inflation rate.

-r = i - π

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 + π

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 + πe

The Fisher Effect did not hold in the 19th 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.

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 + πe , 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.

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.

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.

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.

Inflation and Seigniorage: What is Optimal?

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 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 analagous 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 househols 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 exchnage for 1 dollar next period instead, the personal household discounts the future at a rate of 1% per period; the higher this persoanl 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 nexct 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 if 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 hosueholds 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.

Price Level Stability~~Some economists view that the optimal rate of inflatin 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 masrket price of firm’s good hasd 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 in neither desirable nor possible; the production and investmernt 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.

Labour Market Rigities 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, contractural arrangements may preclude such adjustment frm 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 resistence 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.

Seigniorage~~Governments must raise revenues ot 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 are: (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 toal 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 alos 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 differen 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 taqx 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 preceived 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 infaltion is unclear. Ireland (199$) 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.

**Misery Rates**

**Poverty Rates**

**Employment Rates**

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 scare 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 of 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

Renshaw 1995 engineering a soft landing for the US economy once the unemployment rate has dipped below 6%, it makes sense for business enterprises to keep a tight rein on inventory accumulation

**Poverty Rates**

**Island Economy**

The central question for a monetary economy is: for a given amount of resources, can the trading environment be altered to allocate those resources more efficiently and thus raise the economy’s overall level of welfare? What this essentially means is by what means should the tools of financial repression and financial facilitation be utilised in a properly functioning economy. As money in general and the financial markets and asset pricing in particular is a very political process, there is not 1 single answer to this question. All societies value differ things, and as such their governments will strive to ensure that the demands of the economy to which they govern are sufficiently met as efficiently as possible.

A constant growth rule would include 3 aspects: innovation, labour supply (population), and persons. Resources growth is not constant, as rather it requires immediate 1 time increase in wealth. The money supply is not permanent like people and technology~~when those 2 fall, whole society does too as they are the rock of society. A monetary rule like this keeps IR rates constant £'s~~Short term, IT, Long term. When offshore or foreign trading is introduced, must institute caps to account for BOP differences year to year; even if BOP is more or less, do not go beyond cap to prevent too much fluctuation.

It is more correct to say 'innovation' not 'technology' when talking about progress, as technology refers more to computers while innovation could mean any sort of productivity increase, and so technology is innovation yet all innovation is not technology. It is easier to predict labour growth rate, while innovation is very hard year to year because of computers~~resources for instant and one-time wealth increase is difficult too. Computers (innovation) have increased wealth much lately as more borrowers can find more lenders at different rates, which increases wealth by increasing the efficiniency of the financial intermediation system.

The central bank uses policy tools to create policy instruments. It then identifies intermediate targets to attempt to achieve the policy goals, and uses information variables to determine if policy goals have been met. The policy goals are the desired result, and everything else is built around achieving the goals. The policy tools are rather concrete for a monetary economy, as are the policy instruments. The intermediate targets can be manipulated to some degree to achieve specific policy goals. The information variables commonly tend to be the intermediate targets.

So the goal is to analyse how the intermeidate targets affect the policy goals, and in fact if some of the information variables could be fixed what would then be the new outcome for the policy goals.

There is a quite dynamic interaction between the money supply, exchange rates, inflation rates, and interest rates. The monetary aggregate can be fixed by using a monetary rule, the market interest rate can be fixed by the government, as can the exchange rate to a degree (no country has a truly floating exchange regime). The inflation rate can not be fixed, and thus tends to be the primary target for most central banks.

However, by using a hypothetical model of the island economy and a suggested monetary rule, one can use past time series data collected from various central banks to analyse what expected output, employment, poverty, and inflation rates would likely be with a fixed monetary rule and fixed interest rates. Thus, how does monetary policy affect inflation rates, exchange rates, interest rates, employment rates, poverty rates, and output. A further study examines how fixed interest rates along with a monetary rule may influence these variables, and even further how exchange rates may better be understood through better calculation.

A further concern is the counterfeiting of money and thus true monetary value of currency; the swiss franc has long been premier in fighting counterfeiting and so the swiss franc is used for exchange rate comparison.

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.

Table
***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

**5 Policy Goals**

1. output

2. employment

3. inflation

4. poverty rate

5. exchange rate

**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

4. inflation rates
5. misery rates

VM= effects of: (ET + IRT + IFT + MS)

**-value (velocity) of money- exchange rates, interest rates, inflation rates, money supply??? Where did this come from**

**Tools for economic objective completion**

1. monetary policy

2. exchange rates

3. tax laws~~fiscal policy

4. interest rates

The American economic system has seen its share of recession and growth through the years. All economies see a normal regression and progression trend throughout their existence, and the American economy is no different. However, the question we are now confronted with is whether or not we have developed sophisticated enough monetary and financial tools to be able to combat the deep regressions and instill a greater degree of stability in the American economy. Could it not be possible that many of the tools we have could be administered in a slightly differ manner so as to achieve greater operating efficiency as a nation.

-yield curve is a good economic indicator; but what if the government had no debt and issued no bonds; what would be then

In an ideally balanced economy, the following variables will be in balance.

*E= CA + IA + GA*

Where E is the total balance of the home economy; CA is the effect of corporate actions; IA is the effect of individual actions; and GA is the effect of government actions. These 3 primary variables can be broken down further.

Government actions represent the single most influential force on home economic stability. GA is influenced by 4 factors: taxation policy (T); FG, FC, and FI, which stand for foreign influxes resulting from foreign policy determination. Taxation policy includes several pieces: the funds determined to be paid, the degree of instrument manipulation allowed due to taxation policies.

In the essence espoused here, taxation encompasses more than just the codification of funds required to be collected by the government. It also includes the policies that dictate which instruments may be used and how they may be used. The reason taxation encompasses these policy issues is that a change in the tax code can effect the same change in instrument usage as can policy debarment. This is because the tax code is very powerful, and policy changes can be written in, as is done so, while simultaneously change taxation percentages.

We can now rewrite the equation as:

*E= CA + IA + (T + FG + FC + FI)*

*or*

*E= CA + IA + (T + FPD)*

Corporate actions constitute the second most influential category on home economic stability. CA is comprised of utilization of investment vehicles, which is influenced by government taxation policy. Therefore, taxation does not have to be accounted for again here. In dealing with the corporate aspect, focus can be directed to corporate manipulation of financial instruments. This includes the usage of offshore centers, which is influenced directly by government tax law.

Individual actions embody the least influential group of the 3 primary economic influencers. The usage of different investment vehicles is central here as with CA, but fewer instruments can potentially be used, there are just fewer options.

IA= Si + Bi + Ts + MFi + Ci

Where S is stocks; B is bonds; Ts is trusts; MF is mutual funds.

We can get total market cap of these instruments. Then divide by total market cap to see each’s influence.

Market cap is defined as total debt outstanding plus total equity (or assets):

**Island economy**

Economic indicator variables for regresand

-with assumptions based on real life case study of USA

-analyze past collapses and supposed reasons: apply those reasons here

-how the economy reacted to those: which EIV fluctuated most

-credit policies and utilization; v. instruments

**Measurement of regressors**

1) GA

2) CA

3) IA

**Measurement of regressands**

1) inflation

2) exchange rates

3) short-term interest rates

4) long-term interest rates

*E= CA + IA + GA*

-where E = IR + IF + ER

-where IR = SR + LR

-interest rates are measured by the term yield

*SR + LR + IF + ER = CA + IA + GA*

A. Effect of Financial Instruments on Home Economic Stability

-analyze investment vehicles firms use and their net impact on firm performance; home performance

1) hedging

-how it can be done most financially productive

B. Tax Effects from Diverted Funds on Economic Stability

**Ideal investment structure of the firm**

1. preferred dividends- 70% exempt

2. trust and tax shelters

3. by using tax shelters, although necessary for multinational business, corporations can effectively report 0 income, and pay taxes only through the AMT

Y = C (T-Y) + I(r) + G + X

**Empirical Facts**

1. work week not changed since WWII- labour-leisure

2. S not changed since WWII- consumption/savings

3. real interest rates are constant in the long run; portfolio allocation

4. price elasticity of money is = 1; this is because the demand for money is based on the purchasing power of money

5. for most measures of money, the real income elasticity of demand for money, α2, is close to 1.

6. money prices fluctuate over the business cycle

7. business cycle length since WWII has been 7.5 years

8. 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.

9. real interest rates on capital assets are stable over time

10. prices become more volatile as the inflation rate increases

11. the price signals on which production decisions depend are imperfect predictors of future supply and demand conditions; this risk is unavoidable and represents an essential degree of risk a healthy economy must incur

12. different monetary aggregates covary differently with short term nominal interest rates.

13. broad monetary aggregates covary positively with output.

Conventional theory says that as technology improves, so does demand for labour. Opposite, as technology increases, demand for labour decreases in that industry, but opens up positions in other industries for the people to work in.

Which Variables to Fix

1. Interest rate

2. Savings

3.

The expansion of wealth for a society must be analysed directly with the money supply. The money supply is our direct most observed indicator of wealth, and although wealth can only increase by a few avenues.

A monetary rule for monetary economies is as follows:

MGR = (X)technology + (Y)resources + (Z)personnel

Table

**Ways to Increase Wealth**

1. technology

2. resources

3. personnel- productivity and efficiency gains

Wealth must be increased before consumption and utility can increase. This leads to an increase in output. Without legitimate permanent increases in the real wealth of a society, increased consumption cannot be maintained; it can ebb and flow with the business cycles, but cannot reach a sustained higher level.

NAIRU

Nonaccelerated inflation rate of unemployment

**Microeconomics Behind Macroeconomics**

**Government Debt**

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 was and falls during peace time. Deficit financing of wars appears optimal for reasons of both tax smoothing and generational equity.

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 are: (1) inflation (2) capital assets (3) uncounted liabilities (4) business cycle. Inflation is least controversial of the measurement issues; currently measured in nominal terms, better economic term if it is measured in real terms. 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. 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. 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.

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.

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 are: (1) myopia (2) borrowing restraints (3) future generations. Myopia argues people are not rational and will spend just because and fail to prepare for the future. 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. 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.

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 are: (1) stabilisation (2) tax smoothing (3) intergenerational redistribution. In addition to Ricardian and Traditional views. Most states must have a balanced budget, several reasons the federal government doesn’t. 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. 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. 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 are: (1) high government debt can lead to capital flight (2) high government debt can lessen political clout. Wen a government budget deficit reduces national saving, it often leads to a trade deficit, which in turn is financed by borrowing from abroad.

4 Benefits of Indexed Bonds are: (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.

**Consumption**

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. 3 Conjectures are: (1) MPC and (2) APC (3) I is primary determinant of C and (r) does not have an important role. MPC- marginal propensity to consume is 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. APC- average propensity to consume is ratio of C to I, falls as income rises; S is a luxury, not essential to his theory. 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.

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 are: (1) intertemporal budget constraint (2) consumer preferences (3) optimisation (4) changes in income affecting (C)

(5) changes in real interest rate affecting C (6) constraints on borrowing.

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. Consumer preferences indifference curves-shows the combinations of 1st and 2nd 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. 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. Changes in income affecting C an increase in either 1st or 2nd 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. 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 1st 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 2nd period, but have opposite effects in the 1st period. Constraints on borrowing if the consumer cannot borrow, he faces the additional constraint that 1st period C cannot exceed 1st 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.

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.

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.

Robert Hall and the Random-Walk Hypothesis~~Derived the implications of the rational ecxpectations 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.

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**

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 are: (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: ¾ 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 are: (1) the rental price of capital—producer firms (2) The cost of capital—rental firms

(3) determinants of investment (4) taxes and investment (5) stock market and Tobin's q (6) financing constraints. 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. 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. 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 firms 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. 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. 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. 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.

Residential Investment~~Includes new homes for living in and homes to be rented. 2 Parts are:

(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.

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 are: (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.

**Full Employment and Monetary Policy Neutrality**

Modeling 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 equilbrium 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

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 are: (1) Households (2) Firms (3) Government.

Households objective is to maximise utility, which is derived from consumption and leisure. 3 Decisions are: (1) consumptin/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. 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 consumtion 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. Consumption/Savings Decision periodically, the household receives real wage income from labour services and real interest income from bonds urchased with savings. A portion of this income is dedicated to consumptin 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 typicaally allocate the same amount of each eqach period. 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 indusing households to shift wealth from money to bonds. Labour/Leisure Decision the role of hosueholds 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 permamently increase productivity of labour; this increases demand for labour and dercreases 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.

Firms objective is to maximise profits. 2 Decisions are: (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. Technology of the Goods-Producing Firms must also characterise the economy’s technology fro 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 imporved 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 dininishing marginal returns.

The MPL is a negative function of employment and a positive function of the level of technology. In the long-run, firms plans 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.

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. 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 invetsment. 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 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.

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.

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, MS, and therefore the price level, P. The real stock of money supply in the economy is found by deflating the nominla money supply by the price level: MS/P. Because the nominal money supply is determined exogenously as a matter of polic, the money supply shcedule 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.

General Equilibrium~~General equilibrium occurs when households make consumption/savings, laboour/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 al 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 equilbrium 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.

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 yeilds 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 purses short run goals of full employment, it is impossible to measure what full employment is or whether it has been achieved.

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 equiproortionate 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**

Total Factor Productivity Shocks~~many macroeconomic theories attribute a large share of the short run fluctuations that collectively constitute trhe 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 prdicted, their randomness can result in randomness in equilbrium 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 are: (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 are: (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 are:

(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 characrterised by the shirt-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 prioer 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 productivty shocks on the economy, because the productivty 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 reuslt of the improved technology; there are diminishing marginal returns to K, but improved technology raises K productivity. In the short-run macro model, the K stock is fixed but its productivity is not; therefore, an increase in technology θ raises the productivity of both K and L and in fact, the productivity imporvements of the 2 factors of production are equiproportionate ; for that reason, increases or decreases in θ are called total factor productivity shocks (factor specific productivity shocks).

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.

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 do due increases in the real wage due to productivity gains, or they could work less and gain more leisure time while still maintaining the same amountn 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 productivty 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 subtitution effects off set each other, even though labour productivty 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 househld’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.

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 decsions 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 ultimatley leads to an increase in real wages that is due solely to a fall in the price level.

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.

Equilibrium Analysis of a Positive Productivity Shock with Monetary Accommodation~~The policy objectives of the central bank are: stabilising output growth arounf 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 3rd 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 intervens 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 hosueholds 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

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 are: (1) intratemporal (2) intertemporal. In both cases, the household’s 3 primary decisions are altered which induces transitory equilibrium fluctuations into the economy. 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. 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 freduced 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 thereforeworking less and reducing their S to maintain their current levels of consumption.

**The Open Economy**

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 = Cd + Id + Gd + EX

C= Cd + Cf

I = Id + If

G= Gd + Gf

Net exports, or trade balance is 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 out 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).

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.

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 \* (PD/PF). 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 are: (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 are: (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 are: (1) some goods are not easily traded- haircuts (2) preferences- real exchange rates do vary because of this.

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 are: (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.

**Classical Theory: The Economy in the Long Run**

National Income: Where it Comes From and Where it Goes

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 are: (1) Factors of Production (2) Production function.

Factors of production are: quantity of inputs to produce goods and services: K,L. We assume fixed amounts of labour an capital (bar on top), and that factors of production are fully utilized; nothing is wasted (real world assumptions change). Production Function is the 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.

How is National Income Distributed to the Factors of Production~~Ttotal 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.

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 are: (1) Consumption (2) Investment (3) Government Purchases

Consumption is 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. Investment is 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. Government Purchases is 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.

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 is (Y-T-C).

Public saving is (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.

**Growth Theory: The Economy in the Very Long Run**

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 are:

(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 are: (1) supply and demand for goods determines accumulation of capital

(2) introduce labour forces (3) introduce technology. 2 Main Parts of Solow are: (1) production function: supply for goods (2) consumption function: demand for goods.

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

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 are: (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.

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 needs 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 are: (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.

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.

3 Effects of Population Growth are: (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 – depreciation = population growth

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 an technological progress, the Golden Rule (consumption-maximising) steady state is characterised by equality between the net MPK (MPK-δ) 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 are: (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.

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 are: (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 are: (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.

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 are: (1) balanced growth (2) convergence. 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). 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. 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.

Causes of International Differences in Output are: (1) factor accumulation (2) production efficiency.

Factor aqccumulation is differences in quantities of human and physical capital. Production efficiency is 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.

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 are: (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.

Growth Accounting this breakdown provides us with a measure of the rate of technological change.

3 Sources of Growth are: (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.

The speed with which wages and prices adjust, a key feature of macroeconomics, is not as big of a deal in monetary economics. 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, while sticky prices adjust slowly.

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 is 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.

***Efficiency in Production***

After ensuring efficient allocation of final goods, the production inputs must allocated efficiently as well. Technical efficiency is 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. The production contract curve is the 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

The production possibilities frontier is the 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 is the 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.

There are gains from free trade, as free international trade expands a country’s production possibilities frontier; as a result, consumers are better off. Absolute advantage is the 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 is the 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.

Competitive markets may be inefficient for several reasons: (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. There are 3 Efficiencies in competitive markets: (1) efficiency in exchange (2) efficiency in the use of inputs for production

(3) efficiency in the output market.

4 reasons why markets fail include: (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.

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 is a 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.

Market Signaling can help sellers 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 is a 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.

Externalities can be positive (pretty garden, too little production) or negative (river waste, too much production). An 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 is an 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. Negative externalities generate both long-run and short-run inefficiencies; negative externalities encourage too many firms to stay in the industry. Positive externalities result in too little production; a firm does R&D and other firms don’t have to now.

Ways of Correcting Market Failure are 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.

1. Vault cash (VC) is one of 2 total reserves banks hold; the other 1 is deposits at the central bank (FD); known as the Fed in the USA. [↑](#footnote-ref-0)
2. All societies mature from autarkic to barter transaction systems, and eventually to monetary transaction systems. The five stages in this progression are: 1) autarkic 2) biltaeral with intermediate barter 3) commodity monetary 4) representative commodity money 5) fiat money [↑](#footnote-ref-1)
3. These are all domestic measures; operating efficiency in the foreign market is not as important or as easily quantified. [↑](#footnote-ref-2)
4. The underground economy can vary widely from country to country. [↑](#footnote-ref-3)
5. This inflation differs from domestic inflation, where market demand and supply interact to influence purchasing power. It is quite difficult to actually separate the 2 for economic analysis. [↑](#footnote-ref-4)
6. A multiple currency system was used in the USA in the 1800's, but the National Bank Act 1863-1864 called for consolidating private bank notes into a single national bank note; private banks could trade their currency for national notes; any private bank wanting to issue private currency had to pay a tax of 200%, so a multiple currency system was essentially taxed out of existence [↑](#footnote-ref-5)
7. The imaginary attributes of money arise from the money creation process~~money is created with the stroke of the pencil by any individual with requisite authority. [↑](#footnote-ref-6)