BBA-102

PRINCIPLES OF ECONOMICS

DIRECTORATE OF DISTANCE EDUCATION

SWAMI VIVEKANAND

SUBHARTI UNIVERSITY

Meerut (National Capital Region Delhi)

CONTENTS

Unit 1: Nature of Economics

Unit 2: National Income

Unit 3: Production

Unit 4: Demand and Law of Demand

Unit 5: Elasticity of Demand

Unit 6: Supply

Unit 7: Concepts of Costs

SYLLABUS

BBA-I Semester-I Year

PRINCIPLES OF ECONOMICS

BBA-102

Course Code: BBA 102 N		
Course Credit: 04	Lecture: 04	Tutorial: 1
Course Type:	Core Course	
Lectures delivered:	30 L + 10 T	

End Semester Examination System

Maximum Marks Allotted	Minimum Pass Marks	Time Allowed
70	28	3 Hours

Continuous Comprehensive Assessment (CCA) Pattern

Tests	Assignment/ Tutorial/ Presentation/class test	Attendance	Total
15	5	10	30

Course Objective:

1. To promote the ability to understand the basic concepts of Economics
2. To apply economic analysis in the formulation of business policies.
3. To use economic reasoning to problems of business.

UNIT	Content	Hours
I	Economics – Nature and Characteristics – Scope – Relationship with other disciplines. Concept of Utility – Law of Diminishing Marginal Utility. Concept of Consumer Surplus	8
II	**Demand, Supply and Market equilibrium:** individual demand, market demand, Laws of Demand. Determinants of demand, movements vs. shift in demand curve. Elasticity of demand, Price elasticity of demand.1**Supply:** Determinants of Supply. Market equilibrium and price determination.	14
III	**Theory of Production** : Meaning and Concept of Production, Factors of Production and Production function, Law of Variable Proportions (Short Run Production Analysis), Law of Returns to a scale.	10
IV	**Cost Analysis :** Accounting Costs and Economic Costs, Short Run Cost Analysis : Fixed, Variable and Total Cost Curves, Average and Marginal Costs, Long Run Cost Analysis : Economies and Diseconomies of Scale and Long Run Average and Marginal Cost Curves	12
V	Market Structures- Types, Factors affecting types of market structures, Perfect and imperfect competition. Monopoly, Monopolistic competition and Oligopoly. Price and Output determination under perfect competition.	6

Course Outcomes:

Upon successful completion of the course, students will be able to:

1. Understand that economics is about the allocation of scarce resources.
2. List the determinants of the demand and supply for a good in a competitive market and explain how that demand and supply together determine equilibrium price.
3. Understand the costs of production and how profit-maximizing firms determine how much to produce. Be able to distinguish between long-run decisions and short-run decisions.
4. Distinguish between perfect competition and imperfect competition and be able to explain the welfare loss in non-competitive markets.

Text Books:

1. Ahuja, H.L., Business Economics, S. Chand & Co., New Delhi.
2. M. L. Seth, Micro Economics
3. Deepashree, Principles of Micro Economics, Ane Books Pvt Ltd, New Delhi
4. I.C. Dhingra, Microeconomics - Theory & Practice, S. Chand & Co., New Delhi.

Reference Books:

1. Dominick Salvatore. Principles of Microeconomics (5th ed.) Oxford University Press
2. Principles of Economics, Economic Analysis – V.Lokanathan.
3. Economic Analysis – K.P.M. Sundharam&E.N. Sundharam.
4. SPS Chauhan, Micro Economics, An Advanced Treatise, Prentice Hall of India.

Weblinks

1. https://www.mooc-list.com/course/econ-1-principles-economics-stanford-online
2. https://swayam.gov.in/course/4444-an-introduction-to-microeconomics
3. https://www.youtube.com/watch?v=Vss3nofHpZI
4. https://swayam.gov.in/course/4327-fundamentals-of-microeconomic-theory

UNIT 1: NATURE OF ECONOMICS

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STRUCTURE

1.1 INTRODUCTION

Economics has been recognized as a special area of study for over a century. Economics may appear to be the study of complicated tables and charts, statistics and numbers but more specifically, it is the study of what constitutes rational human behaviour in the endeavor to fulfill needs and wants.

As an individual, for example, you face the problem of having only limited resources with which to fulfill your wants and needs, as a result, you must make certain choices with your money. You'll probably spend part of your money on rent, electricity and food. Then you might use the rest to go to the movies or buy a new pair of jeans. Economists are interested in the choices you make, and inquire into why, for instance, you might choose to spend your money on a new DVD player instead of replacing your old TV. They would want to know whether you would still buy a carton of cigarettes if prices increased by ₹ 2 per pack. The underlying essence of economics is trying to understand how both individuals and nations behave in response to certain material constraints.

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We can say, therefore, that economics, often referred to as the "dismal science", is a study of certain aspects of society. **Adam Smith** (1723 – 1790), the "father of modern economics" and author of the famous book "*An Inquiry into the Nature and Causes of the Wealth of Nations*", spawned the discipline of economics by trying to understand why some nations prospered while others lagged behind in poverty. Others after him also explored how a nation's allocation of resources affects its wealth.

To study these things, economics makes the assumption that human beings will aim to fulfill their self-interests. It also assumes that individuals are rational in their efforts to fulfill their unlimited wants and needs. Economics, therefore, is a social science, which examines people behaving according to their self-interests. The definition set out at the turn of the twentieth century by **Alfred Marshall**, author of "*The Principles of Economics*" (1890), reflects the complexity underlying economics: "Thus it is on one side the study of wealth; and on the other, and more important side, a part of the study of man."

1.2 EVOLUTION OF ECONOMICS

The **evolution of economics** deals with different thinkers and theories in the field of economics from the middle age right up to the present day. Although the British philosopher **Adam Smith** is generally considered as the father of economics, his ideas built upon a considerable body of work from predecessors in the eighteenth century, who in turn were grappling with wisdom received from centuries before and attempting to apply it to a modern setting. **Adam Smith** wrote at the beginning of unprecedented social upheaval, in what became known as the industrial revolution. For the first time in history inventions such as James Watt's steam engine, Andrew Meikles's threshing machine, new modern cotton mills and advances in coal extraction and iron manufacture meant that people could produce goods beyond those necessary for subsistence. Changes in economic thought have always accompanied changes in the economy, just as changes in economic thought have propelled change in economic policy.

Economic thought has evolved through feudalism in the Middle Ages, through mercantilist theory in the renaissance, through modern political economy during the industrial revolution, to the fractured economic schools of thought that dragged humanity into the twentieth century and a new globalised era of the twenty first. Following **Adam Smith's** *Wealth of Nations*, *classical economists* such as **David Ricardo** and **John Stuart Mill** examined the ways the landed, capitalist and labouring classes produced and distributed national riches. **Karl Marx** was then to castigate the capitalist system of exploitation and alienation he saw around him, before neo-classical economics in a new Imperial era sought to erect a more mathematically and scientifically grounded field above this politics.

After the war of the early twentieth century, **John Maynard Keynes** led a reaction against governmental abstention from economic affairs, advocating interventionist fiscal policy to stimulate economic demand, growth and prosperity. But with a world divided between the capitalist first world, the communist second world, and the poor of the third world, the prevailing consensus broke down. Men like **Milton Friedman** and **Friedrich von Hayek** caught the imagination of western leaders, warning of *The Road to Serfdom*

and *Socialism*. With the collapse of the Soviet Union, the political scientist Francis Fukuyama proclaimed the victory for liberal democracy and an End of History. Yet the twenty first century begins, the history of economic thought continues in an increasingly globalised economy.

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1.3 WHAT IS ECONOMICS?

Economics is the *social science* that studies the production, *distribution,* and consumption of goods and services. The term *economics* comes from the Greek for *oikos* (house) and *nomos* (custom or law); thus economics means "rules of the house hold." It is a complex social science that spans from mathematics to psychology. At its most basic, however, economics considers how a society provides for its needs. Its most basic need is survival; which requires food, clothing and shelter. Once those are covered, it can then look at more sophisticated commodities such as services, personal transport, entertainment, the list goes on. Today, this social science known as "Economics" tends to refer only to the type of economic thought which political economists refer to as*Neoclassical Economics.* The economics is divided into various sections such as—production, distribution, consumption and exchange etc.

1.3.1 Production

In economics, all those activities that have to do with the creation of commodities, by imparting to raw materials utility, added value, or the ability to satisfy human wants. The farmer who grows wheat, the miller who grinds the wheat into flour, and the baker who transforms flour into bread are examples of producers who, each in his own way, impart utility to a natural or partially processed material. Production was the major thrust of industry until at least the beginning of the 20th cent., when sales and marketing began to be considered equally important in the transference of commodities from producers to consumers.

1.3.2 Distribution

In economics, the allocation of a society's total wealth among various economic groups. Distribution, in that sense, does not refer to the physical marketing or circulation of goods, which is part of the process of exchange, but to the relative well-being and economic wealth of persons and groups.

1.3.3 Consumption

Process of using consumer products in order to satisfy desires and real or imagined needs so that the products are used up, transformed, or deteriorated in such a manner as not to be either reusable or recognizable in their original form.

1.3.4 Exchange

Mutual transfer of goods, money, services, or their equivalents; also the marketplace where such transfer occurs, such as a stock exchange or a commodity exchange. In

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early human society, exchange of unessential articles, such as jewelry, was common, but no group could afford to rely on another group for the necessities of life. Gradually, division of labor led to the barter economy, in which articles were produced for exchange.

In other words economics is the study of how individual and societies choose to use the scarce resources that nature and previous generations have passed to them. In a large measure, it is the behavioural science studying individual choices and more broadly societal choices added up from them. Either you are planning the upcoming holiday against limited time or slicing a gigantic watermelon with several of your siblings, you are doing economics.

In general way economics is a social science that studies the allocation of limited resources used to produce the goods and services that satisfy unlimited consumer wants and needs. Economics is one of several social sciences (others are sociology, political science, and anthropology) which apply the scientific method to human behaviour. The distinguishing feature of economics is a concern with the fundamental problem of scarcity—unlimited wants and needs and limited resources.

1.4 SCOPE OF ECONOMICS

Economics has deep roots and close ties in most society problems and global affairs; it also has come a long way with social philosophy, thus bringing about the breadth and depth of this discipline. Let's first take a brief look at the two major divisions of economics: *microeconomics* and *macroeconomics*.

1.4.1 Microeconomics

The term *micro* has been derived from the Greek word *micros*, which means small. In microeconomics attention is concentrated on a very small part of individual units. The microeconomics is the study of the particular firms, household, individual prices, wages, incomes ext. *Microeconomics studies behaviours of individual decision makers such as you in a particular market such as that for refrigerator, and their interelationships.* Microeconomics examines the factors that influence individual economic choices and how the choices of various decision makers are coordinated by markets. To illustrate, microeconomics explains how price and quantity supplied for a certain product interact, determine each other and finally come to equilibrium.

Microeconomics examines how these decisions and behaviours affect the supply and demand for goods and services, which determines prices, and how prices, in turn, determine the supply and demand of goods and services.

1.4.2 Macroeconomics

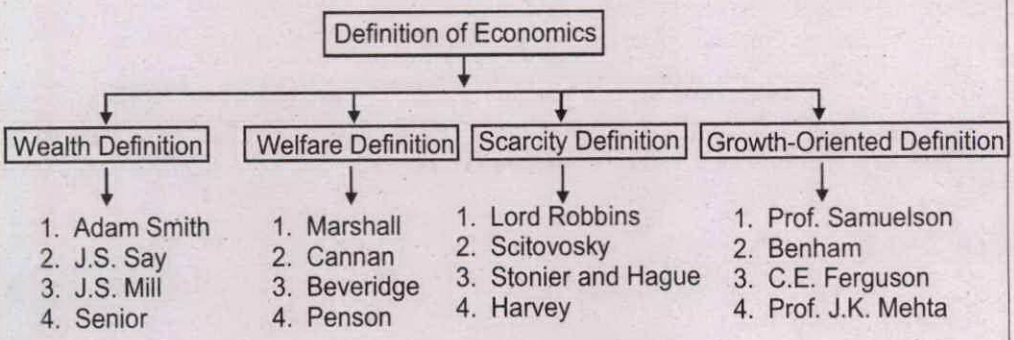
This also derived from Greek word macros, meaning large. Macroeconomics is a branch of *Economics* that deals with the performance, structure, and behaviour of the *economy* as a whole. Macroeconomists seek to understand the determinants of aggregate trends in the economy with particular focus on national income, unemployment, inflation, investment, and international trade. In contrast, *microeconomics* is primarily focused on the determination

of *prices* and the role of prices in allocating scarce resources. It implies the study of economics aggregates or the wholes. The problems like full employment, unemployment, economic stability and economic growth cannot be accurately investigated through the examination of infinitesimally Small units like individual consumer, producer, workers or firms. The action of a single employer cannot have a perceptible impact upon the employment situation of a country. The production or investment by a single firm is unlike to generate cyclical fluctuations. The proper analysis of such problem requires an aggregated thinking. Full employment, economic growth and instability are concerned with entire economic system.

Unlike microeconomics that studies particular markets, macroeconomics dedicates itself into the overall behaviour and performance of an entire economy. What happens in an economy is the outcome of thousands of millions of individual decisions, and macroeconomics puts all the small pieces that are subjects of microeconomics together to focus on the big picture, as at a national or a global level.

1.5 DEFINITION OF ECONOMICS

In General way, economics is a social science which deals with the production, distribution and consumption of goods and services. There are a large number of economist give their different definitions. Some say that there is no requirement of definition of economics this is because economics growing continuously. But most of the economists agree with the view that defining economics is must. On the basis of these economist, the definition of economics is divided into four parts such as:



- Wealth definition given by "**ADAM SMITH**"
- Welfare definition given by" **MARSHALL**"
- Scarcity definition given by "**ROBBINS**"
- Growth-oriented definition given by "**SAMUELSON**"

These definitions of various economists are explained with the help of features, merits and demerits as given under:

1.5.1 Wealth Definition by Adam Smith

Adam Smith was an important Scottish political philosopher and economist whose famous work Wealth of Nations (1776) set the tone for work on politics and economics for many

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people even through today. This was, in fact, the first comprehensive effort to study the nature of capital, the development of industry and the effects of large-scale commerce in Europe. **Adam Smith** says, "The self-interested pursuit of wealth may not be individually satisfying but leads to an aggregate increase in wealth that is in the best interests of a nation."

Some other economists like **J.S. Mill, J.B. Say,** and **Walker** etc. also follow the wealth definition. These all economists are agreed on the point that economics is the study of production, distribution, exchange and consumption of wealth. In other way economics is the body of knowledge, which deals with the wealth.

Definitions

Some definitions of different economists related to Economies given as under:

Adam Smith—*Economics is an enquiry into the nature and causes of wealth of nation.*

J.B. Say—*Economics is the science which treats of wealth.*

J.S. Mill—*Economics is the practical science of the production and distribution of wealth.*

Senior—*The subject treated by political economics is not happiness but wealth.*

Features of Wealth Definition

The following are the features of the wealth definition:

1. Meaning of Wealth. Wealth is the term in this definition; those material goods which are used to satisfy our wants and which are also scare. Goods are divided in parts that are material goods and non-material goods. Material goods are those which are tangible means which we can be seen and touched for example books, radio, television, mobile and paper etc. and non-material goods are those which are neither seen and nor touched for example service of a teacher, service of cell phone network and service of a doctor etc. are not treated as a wealth.

2. Economics is the Wealth Only. According to this definition economics is only the study of wealth. This definition gives first preference to the wealth and then to the study of man. It also tells about how to increase the wealth of a nation.

3. Economic Man. The user of this definition of economics are think about a man who fully know about his self-interest and who also know how to satisfy his wants this man is called economic man.

4. Causes of Wealth. This definition tells us about the ways by which the wealth of a nation is increase, which means economic development. To increase wealth, production of material goods will have to step up. There are two ways to increase the wealth such as (1) by increasing the demand of goods (2) by increasing the supply of goods.

Merits

Wealth definition is telling us about the ways by which the wealth of the nation is increase. This is the main merit of this definition, which helps in growth of economic condition of a country. It also tells about the causes by which the wealth is increase.

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Demerits

Following are the main demerits of the wealth definition:

1. More Importance to the Wealth. This definition gives more importance to the wealth than man. This definition ignore that wealth is used to satisfy human wants not an end. Man and not wealth should have been given more importance. Wealth has been given primary and man only secondary place.

2. Neglect of Welfare. This definition not tells about the welfare of the society. It gives too much importance to the wealth. It gives no attention to the well being of the society by proper use and equal distribution of wealth.

3. Narrow Meaning of Wealth. In this definition wealth is only the tangible things and all non-tangible things such as services of a doctor, service of a professor and cell phone network service etc. have been remain out side the scope of economics. Economics is not only concerned with obtaining of wealth, its aim is the welfare of man.

4. Neglect the Problem of Scarcity. This definition not use the two main terms of economics that is scarcity and choice. In economics a problem is created because the wants are unlimited and the means, which satisfied the wants, are scarce. The problem is also arising due to the choice.

5. Individual and Social Needs are not Separated. This definition is only told about the wealth not about to the needs of the individual. It tells how to use the wealth to satisfy the need of society not about to the individual.

1.5.2 Welfare Definition by Alfred Marshall

Alfred Marshall was born in London, on 26 July 1842. Professor of Political Economy at the University of Cambridge from 1885 to 1908, he was the founder of the Cambridge School of Economics which rose to great eminence in the 1920s and 1930s. Alfred Marshall's magnum opus, the Principles of Economics was published in 1890. **Marshall** relates the definition of economics with material welfare.

Some other neoclassical economist such as Cannan, Beveridge, and Penson etc. who are also shifted the emphasis of economics from wealth to welfare. They tell about that economics is the study of human welfare. They also tell us that wealth is for human and human are not for wealth. In the other words economics is the study of economic welfare, being described as that part of social welfare, which can be brought directly or indirectly into relation with the measuring rod of money.

Definitions

Some definitions of different economists related to Economics given as under:

Marshall—*Economics is the study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of material requited for well being.*

Cannan—*The aim of political economy is the explanation of general causes on which the material welfare of human being depends.*

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Beveridge—*Economics is the study of the general methods by which men co-operate to meet their material needs.*

Penson—*Economics is the science of material welfare.*

Features of Welfare Definition

The following are the features of the welfare definition:

1. Economics is the Study of Man. This definition gives more importance to the man then to wealth. Wealth is a thing, which is used to satisfy the needs or wants of a man. Main objective of economics is to study human welfare.

2. Ordinary Business of Life. According to this definition wealth earning and wealth spending is the ordinary business of life.

3. Goods for Well-being. This definition also tells us about the goods which are required for well-being such as books, food, pen etc.

4. Study of Social Man. According to this definition economics study the activities of that man who are live in the society. Those men who are participating in the activities of the society are the part of this economics and those who are not participating are remaining outside the scope of economics.

5. Tell about Real Man. The men who are working for him self only are not the part of this economics. Economics is study the real man who participates in societal activates for economic and non-economic motives.

6. Science and Art. Economics is both science and art. It science because it is also a systematic study like science and art because as art is based on certain rule and laws it is also.

7. Money is the Measure of Welfare. Economic welfare is the part of social welfare. It can be measured directly or indirectly with the rod of money.

Merits

Welfare definition is more advanced than wealth definition. It tells about the human welfare and then wealth and also those things which are required for well-being. This definition is more scientific, relevant better than wealth definition.

Criticisms of Welfare Definition

Following are the main criticisms of the welfare definition:

1. Neoclassical economics is sometimes criticized for having a normative bias. In this view, it does not focus on explaining actual economies.
2. The focus on individuals in the economy may obscure analysis of wider long term issues, such as whether the *economic system* is desirable and stable on a finite planet of limited *natural capital*.
3. Large corporations might perhaps come closer to the neoclassical ideal of profit maximization, but this is not necessarily viewed as desirable if this comes at the expense of neglect of wider social issues.

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4. Problems with making the neoclassical general equilibrium theory compatible with an economy that develops over time and includes capital goods.
5. In the opinion of some, these developments have found critical weaknesses in neoclassical economics. Economists, however, have continued to use highly mathematical models, and many equate neoclassical economics with economics, unqualified.
6. The basic theory of a downward sloping aggregate demand curve is criticized for its allegedly strong assumptions.
7. In general, allegedly overly unrealistic assumptions are one of the most common criticisms towards neoclassical economics.
8. The basic theory of production in neoclassical economics is criticized for incorrect assumptions about the rationales of producers.
9. Often at individual levels, variables such as supply and demand, which are independent, are assumed to be independent also at aggregate level. This criticism has been applied to many central theories of neoclassical economics.

1.5.3 Scarcity Definition by Lionel Robbins

Lionel Robbins was a peculiar Englishman in the economics world of the 1920s. His tools were the London School of Economics and a famous 1932 essay on economic methodology. It was his 1932 Essay on the Nature and Significance of Economic Science where Robbins made his Continental credentials clear. He redefines the scope of economics to be "*the science which studies human behaviour as a relationship between scarce means which have alternative uses.*"

Some other economists like **Scitovosky, Harvey, Stonier** and **Hague** also gives scarcity definition of economics. They point out some criticism in the welfare definition that's why they give there scarcity definition. In other words they say, "*Economics is the study of those principles on which the resources of a community should be so regulated and administered as to secure communal ends without waste.*"

Definitions

Some definitions of different economists related to Economics given as under:

Lionel Robbins—*Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.*

Scitovosky—*Economics is the science concerned with the administration of scarce resources.*

Stonier & Hague—*Economics is the fundamentally a study of scarcity and the problem which gives rise.*

Harvey—*Economics is the study of how men allocate their resources to provide for their wants.*

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Features of Scarcity Definition

The following are the features of the scarcity definition:

1. Wants are Unlimited. Human wants are unlimited. In economics we study the wants of human which are related to the goods and services. Though a particular want is satisfied another is created. Thus the man never satisfied all his wants.

2. Limited Resources. The resources, which are satisfied human wants, are scare means limited in amount. A man has to decide which want has to satisfy and which has to leave. Wants are greater than resources.

3. Resources have Alternative Uses. This is the third important problem of an economy that the resources are having alternative uses. For example, milk is used to make a number of products such as curd, tea, butter, and cheese etc. if more is used to tea then less amount is available for other things.

4. Wants Change with Time. This means that the wants of a man is changed with time and they are never remain same. Such as want differ in urgency. Parents want food, house and all the facilities to his child but if the child sick, the want is changed to medical facility.

5. Opportunity Cost. We cannot fulfill our wants simultaneously. If we complete our one want we have left another. For example, if one have ₹ 5 but he want two things pen and food then he spend it on one thing and left another.

Merits

The following are the merits of the scarcity definition:

1. **Economics is Positive Science.** According to this definition economics is a positive science. This deals with the economic activities. It is not told about the welfare.
2. **Explain Economic Problem.** This definition have more reasons to explain the economic problem. The economics problems are due to the limited resources, unlimited wants and alternative uses of the available resources. This definition explains more clearly about the economic problem.
3. **Study Human Behaviour.** This definition is study human behaviour and also about the social man. Economics study the all activities of man in the society. Economics study the behaviour of both the individual and social.
4. **Universal.** This definition is concerned with the universe. It related with wants and scare means of the human being in the universe.

Criticisms of Scarcity Definition

Following are the main criticisms of the scarcity definition:

1. **Economics is not only a value theory.** According to this definition given by Robbins, economics has been concerned to the theory of value but the scope of economics is very big. It also includes the study of national income and employment also.
2. **Not use social aspects of economic activities.** This definition is wrong when it holds that the activities of those who live outside the society also from the part of economics.

3. **Not obey the concept of wealth.** This definition does not use the concept of wealth. It is only concerned with that to allocation of resources in such a manner by which we get maximum satisfaction. Not tell about the goods, which are required to satisfy our wants.
4. **Economics is not only a positive science.** According to this definition economics is only a positive science which deals with satisfactions of our wants. But economics is also a normative science.
5. **Economics is not only micro analysis.** According to this definition economics is concerned with the satisfaction of individual unlimited wants with scare resources.

1.5.4 Growth Oriented Definition by Samuelson

Paul A. Samuelson has personified mainstream economics in the second half of the twentieth century. Paul Samuelson has not been unjustly considered the incarnation of the economics 'establishment' — and as a result, has been both lauded and vilified for virtually everything right and wrong about it. Paul Samuelson's most famous piece of work, "Foundations of Economic Analysis" (1947), one of the grand tomes that helped revive neoclassical economics and launched the era of the mathematization of economics. Samuelson was one of the progenitors of microeconomics and the Neo-Keynesian Synthesis in macroeconomics during the post-war period.

Some other modern economist like **Benham, Lipsey, C.E. Ferguson** etc. also give the growth-oriented definition of economics. Problem of the present use of resources is mainly a problem of choice making and problem of their future growth is a problem of economic growth. Growth oriented definition is concerned with the effective allocation and use of resources so that economic growth can be increased.

Economics is the study of how, in a civilized society, one obtain a share in what other people have produced, and of how the total product of society change and is determined.

Definitions

Some definitions of different economists related to Economics given as under:

Prof. Samuelson—*Economics is the study of how people and society end up choosing with or without the use of money, to employ scarce productive resources that could have alternative uses, it produce various commodities over time and distributes them for consumption, now or in the future, among various persons and groups in society. It analyses cost and benefits of improving patterns of resource allocation.*

Benham—*Economics is the study of the factors affecting employment and standard of living.*

C.E. Ferguson—*Economics is the study of the economic allocation of scarce physical and human means (resources) among competing ends, an allocation that achieves a stipulated optimizing or maximizing objectives.*

Porf. J.K. Mehta—*Economics is a science which studies human behaviour as a means to reach in a situation free of wants.*

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Features of Growth-oriented Definition

The following are the features of the growth oriented definition:

1. Resources. This definition describe about the economic resources which are used to satisfy human wants. These resources are getting by payment of some price.

2. Allocation of Resources. Choice is the main problem of economics. Effective allocation of resources is helpful in full utilization of resources.

3. Full utilization of Resources. This definition described about the economic growth is not increase till the resources are not fully utilized.

4. Improvement in Resources. There are some resources which can be increased by us. By increasing or improving these resources we improve our economic growth.

Merits

The following are the merits of the growth-oriented definition:

1. Practical in nature. These growth-oriented definitions of economics are more practical in nature than the other. These definitions help in solving the economical problems. These are also helped in making economical polices.

2. Universally applicable. These definitions of economics are universally applied. These are related to all type of economic polices and problems of all countries such as developed, developing and underdeveloped. Unemployment, standard of living and per-capita income are the main problem of the universe. These definitions of economics are related to these areas.

3. Solved present days problems. There are many present day problems *i.e.,* production, distribution and consumption of economic resources, it is also solved the future problems related to these resources. It provides the ways of utilization of economic resources.

In the last the growth oriented definitions of economics are complete and advanced. Growth oriented definition is formed by combing the two other definitions *i.e.*, Welfare definition and Scarcity definition. All the merits of these definitions are covered in the above definition. These definitions are universal, practical and dynamic in nature.

1.5.5 Comparison of Marshall and Robbins Definitions of Economics

There are many differences and similarities between the welfare (Marshall) and Scarcity (Robbins) definitions. First some differences of these definitions are given below and then similarities:

Sr. No.	*Point of Difference*	*Marshall's Definition (Welfare definition)*	*Robbins Definition (Scarcity definition)*
1.	Definition	Economics is the study of mankind in the ordinary business of life with the attainment and the use of material required for well being.	Economics is a science which studies human behaviour as a relationship between ends and scarce means which have alternative uses.

2.	Main objective	Human welfare is the main objective of this definition.	Full utilization of economic resources is the main objective of this definition.
3.	Activities	Economics is the study of only economic activities	Economics is the study of both economic and non-economic activities.
4.	Means	All materials required to attainment of material welfare.	All economic resources or scare resources which have alternative uses.
5.	Science	Economics is the social science.	Economics is the human science.
6.	Nature of economics	Economics is the science as well as art.	Economics is the positive science.
7.	Economic analysis	Inductive and deductive both methods are used in the economic analysis.	Only deductive method is used in the economic analysis.
8.	Role of money	Money is the main rod of measuring all economic activities.	Economic resources or scare resources are the measurers of economic activities.

Similarities of Marshall and Robbins Definitions of Economics

There are many similarities between the welfare (Marshall) and Scarcity (Robbins) definitions, some of them are given below:

1. **Study of Man.** Both Marshall's and Robbins definitions of economics are give more stress to the study of man then the wealth. In the both definitions the man is primary and wealth is secondary function.
2. **Science.** Both Marshall's and Robbins says that economics is the science.
3. **Welfare.** Marshall says that the objective of economics is to maximization of human welfare. Robbins says that to utilize the scare resources in such a way that are help in human welfare.

1.6 NATURE OF ECONOMICS

The economic activity of a society consists of activities related to the production and consumption of goods and services. Since earliest times, the primary function of organized society has been economic in nature. The other elements of civilized society—architecture, literature, music, etc.— emerge only after the material needs of the society have been amply provided for. Poor societies do not build great pyramids, erect magnificent cathedrals, or place men on the moon. Everyday, all of us are involved in activities that are primarily economic in nature. To fully understand these activities, we need to create a new perspective of the world—an economic perspective. Let's begin this task with some definitions.

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Goods are tangible outputs of the production process—the good has a physical existence. Production and consumption can be separated by time and place. The farmer grows the wheat in Iowa in May. The girl eats the bread in Georgia in September. Goods include consumer durables, consumer nondurables, and capital (producer durables).

Services are intangible outputs of the production process—services have no physical existence. As a result, production and consumption usually occur at the same time and place. The professor gives a lecture to students in the classroom. Services include education, repair, finance, government, energy, and telecommunications.

Production is the creation of goods and services by combining various elements in the production process. For example, the farmer grows a wheat crop by combining his labour with the land, seed, fertilizer, and machinery.

Consumption is the destruction of goods and services to satisfy the wants and needs of people. A person who is hungry eats a meal, and the food ceases to exist as food.

1.7 ECONOMIC PROBLEM

Economics is often described as a body of knowledge or study that discusses how a society tries to solve the human problems of unlimited wants and scarce resources. Because economics is associated with human behaviour, the study of economics is classified as a social science. Because economics deals with human problems, it cannot be an exact science and one can easily find differing views and descriptions of economics. In this we discuss about the elements that constitute the study of economics, that is, wants, needs, scarcity, resources, economic choice, goods and services. The economic problem arises because our wants are unlimited and the resources, which satisfied our wants, are limited. The resources are divided into two categories *i.e.*, natural resources, and man-made resources.

Definitions

Some definitions of different economists related to Economic Problem given as under:

Prof. Erich Roll—*Economic problem is essentially a problem arising from the necessity of choice of manner in which limited resources with alternative use are disposed of. It is a problem husbandry of resources.*

Robert Awh—*Economic problem is the problem relating to the necessity of choosing what, how and for whom to produce and how to achieve economic growth.*

Leftwich—*Economic problem is concerned with the use of scarce resources among alternative human wants and in using these resources towards the end of satisfying wants as fully as possible.*

1.8 CAUSES OF ECONOMIC PROBLEM

Economic problem is related to the all types of economy rather it is developed, developing or underdeveloped. It is due to the some causes, which are given as under:

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1.8.1 Limited Resources

Limited resource is the basic condition of nature which means that the quantities of available resources used for the production of goods and services are limited. It means that the economy has only some resources that can be used at any given time to produce goods and services. Limited resources are one half of the fundamental problem of scarcity that has plagued humanity since the beginning of time. Huge amount of goods and services are needed to satisfy individual needs and wants. To satisfy hunger, someone needs bread, fruit or milk. The elements or substance which satisfied our needs and wants are divided into the five categories:

1. Natural Resources—are materials found in nature (air, water, plants, timber, animals, etc.)

2. Raw Materials—are resources that will be made into finished products.

3. Renewable Raw Materials—are those raw materials that can be grown and therefore replaced.

4. Non-renewable Raw Materials—which cannot be grown or replaced.

5. Synthetic Materials—are man-made materials. (nylon, dacron, polyester are synthetic fibers as contrasted to cotton, silk, and wool which are natural fibers).

Consider the following four broad resource categories:

1. Labour. This is the mental and physical effort of humans (excluding entrepreneurial organization) that are used for the production of goods and services.

2. Capital. This is the manufactured, artificial, or synthetic good used in the production of other goods, including machinery, equipment, tools, buildings, and vehicles.

3. Land. This is the naturally occurring material of the planet that are used for the production of goods and services, including the land itself; the minerals and nutrients in the ground; the water, wildlife, and vegetation on the surface; and the air above.

4. Entrepreneurship. This is the special sort of human effort that takes on the risk of bringing labour, capital, and land together to produce goods. Entrepreneurship is the factor that organizes the other three.

All above given four scarce resource categories are important to the production of goods used in wants-and-needs-satisfying process that keeps human beings alive from one day to the next and makes living just a little more enjoyable. Land provides the basic raw materials that become the goods. Labor does the hands-on work. Capital is the tool that makes the job easier, and entrepreneurship organizes the entire process.

1.8.2 Unlimited Wants and Needs

While the basic needs of human survival (food, water, shelter, health and education) are important in the function of the economy, human wants are the driving force which stimulates demand for goods and services. In order to curb the economic problem, economists must classify the nature and different wants of consumers, as well as priorities wants and organize production to satisfy as many wants as possible. Unlimited wants and needs are the basic condition of human existence which means that people are never totally satisfied with the quantity and variety of goods and services that consume. It

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means that people never get enough, that there's always something else that they would want or need. No one can fully satisfy his or her wants or needs. When one want is satisfied, another is created. This chain of wants is continues till death. For example in few years ago the demand for colour television is nothing but now every house has the colour television and its demand is moved towards to the LCD home theater. It means our wants are increased with the time and the chain of wants is endless. Unlimited wants and needs are one half of the fundamental problem of scarcity that has plagued humanity since the beginning of time. The other half of the scarcity problem is limited resources.

The economic problem emerges because our desire for goods and services to consume is greater than our ability to produce those goods and services. The demand for goods and services arises from human wants. There are three types of human wants:

1. Biological wants are for the goods and services needed to sustain human life. These are food, shelter, and clothing. These goods are often called "necessities".

2. Cultural wants are for goods and services beyond necessities in order to maintain the socially accepted standard of living. The idea of a standard of living will vary with time and place. An acceptable living standard for 1800 would not be acceptable in 2000. These goods and services are called "conveniences".

3. Demonstration wants are for goods and services beyond conveniences. Thanks to modern telecommunications, we all know about the lifestyles of the rich and famous, and would not mind it for ourselves. These goods and services are called "luxuries". Note that economic development means that the luxuries of yesterday become the conveniences of today!

1.8.3 Alternative Uses

The problem of limited resources and unlimited wants become more complicated due the alternative uses of resources. For example, the milk is used for making a number of product that is tea, curd, cheese and butter etc. that's why it creates a problem.

1.8.4 Scarcity

Scarcity is a pervasive condition of human existence, because society has unlimited wants and needs, but the resources which are used to satisfy these needs and wants are limited. This fundamental condition is the common thread that binds all of the topics studied in economics. This scarcity means:

1. That there is never enough resources to produce everything that everyone would like produced.
2. That some people have to do without some of what that they want or need.
3. That doing one thing, producing one good, performing one activity, forces society to give up something else.
4. That the same resources cannot be used to produce two different goods at the same time.

Humans live in a world of scarcity. This world of scarcity is what the study of economics is all about. That's why scarcity is usually basis economic problem.

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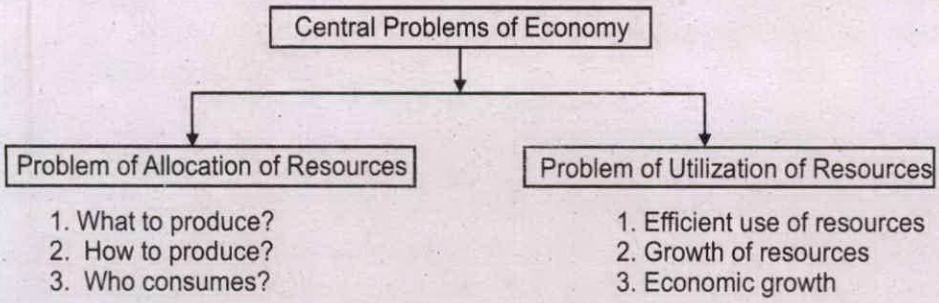
1.9 CENTRAL PROBLEMS OF AN ECONOMY

The problem that makes choice and allocation of resources is called central problem of an economy. All the economy have same central problem. These problems are given as below:



1.9.1 Problem of Allocation of Resources

The three basic questions that an economy must answer because of limited resources and unlimited wants and needs are—What? How? And for whom? The basic problem of scarcity requires every society to determine—What goods to produce? How to produce the goods? And who receives the goods that are produced? The problem of allocation of resources is divided into four categories. Which are given as under: What to produce (Problem related to choice), How to produce (Problem related to technology), who consumes (Problem related to customer)? These functions are explained as:

What to Produce?

The first question society must answer is: What goods and services are produced with society's limited resources? Does society make bagels or bread? Cool-drink or coffee? Computers or laptop? This question is necessary because resources are limited but wants and needs are unlimited. Society wants a lot of goods and services, but everything cannot produce for everyone. Choices must be made. Society must choose among the wide assortment of alternatives when selecting which goods to produce.

How to Produce?

The second question that needs to be answered is: How are society's limited resources combined to produce goods and services? Are jogging shoes made with leather or nylon? Are houses built with wood or brick? Are cars made with high-tech robots or manual labour? Society, must decide which limited resources to use for which goods. Every good cannot be made using the same resources. A hungry consumer may want a hot fudge sundae made with expensive creamy custard, but opts for less expensive ice milk.

Who Consumes?

The third of the three questions of allocation is—Who receives the goods and services produced with society's resources? All goods given to benevolent economics instructors? Should goods be distributed according to shoe size? What if people buy goods with their

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incomes? Now, there is a thought. But, what about people who have no income? With limited resources, the production of goods is also limited. With limited goods, everyone cannot have everything. Society has to decide who gets what.

1.9.2 Problem of Utilization of Resources

There are also three basic concepts which are related to the utilization of economic resources are such as—Efficient use of resources, Growth of resources, Economic growth. These functions are explained as:

1. Efficient Use of Resources. The resources, which are available in all economies, are in limited amount and they cannot satisfy our wants. Then it becomes important to make full utilization of resources. By the help of full utilization of resources economic growth can take place. For example, the use of water.

2. Growth of Resources. The resources, which are available on earth, are scare. The growth of these resources is an important problem of the economy. It is essential to all the economies of every country that to use the resources fully and also grow them. The economy growth of a country is depending on the uses of resources and also on the development of new resources.

3. Economic Growth. The economy of every country works in such a way that it provides maximum economic growth to country and it is possible only when if there is a full utilization of resources. On the bases of prices of resources the resources are divided into two categories that are—Free goods and economic goods. Free goods are those, which are free by nature such as water, sunlight and air etc. These goods are free because there supply is more then there demand. Now economic goods are those for which we have pay some price such as book, bread and pen etc. These are economic because there supply is less then there demand. If the full utilization of these resources is takes place then economic growth goes on to a higher level.

1.10 ECONOMIC SYSTEM

Economic system is a particular set of social institutions which deals with the production, distribution and consumption of goods and services in a particular society. The economic system is composed of people, institutions and their relationships to resources, such as the convention of property. It addresses the problems of economics, like the allocation and scarcity of resources in a given economy. Economic systems are the category of economics that includes the study of different systems. Following are the different types of economic system:

- Market economy
- Global economy
- Capitalist economy
- Political economy
- Mixed economy
- Socialist economy

1.10.1 Market Economy

The market economy is characterized by the voluntary exchange of goods and services in the absence of any government intervention or centralized planning. The market economy operates under the free market where the basic assumption is that the nation's

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well-being is determined by the interaction of market forces like the aggregate demand and supply. The key decisions of what to produce, how to produce and how much to produce are the producers' prerogative unlike the case of the centralized economy.

The market economy is devoid of government interventions such as price fixing, license quotas and industry subsidizations. Friedrich von Hayek had observed that the free market economy led to a more efficient resource allocation, its main advantage. In a market economy, there is freedom to own resources and decide on its allocation. In the US market economy, barriers are imposed on the formation of monopoly powers. But according to the Index of economic freedom, there are lesser restrictions in the countries like Hong Kong and Singapore.

The market economy has many lacunae. There is high chance of complete anarchy in the absence of any government intervention. The role of the government in attaining social welfare cannot be denied completely. The market economy operates to satisfy the private wants, where the society as a whole may not reap the benefits. There may be concentration of wealth in few pockets of the economy. For such disadvantages and much more, the free market economy cannot be fully advocated.

1.10.2 Political Economy

Political economy, basically studies the development process of a polity, *i.e.*, whether the polity is undergoing a surplus or a deficit. Political economy or "the economics of polities", as it was originally known, was the study of production relations vis-à-vis the customs, law and the state in countries born out of the new capitalist order. In short, it was a web of relations between the society and the individual and between the market and the state. The term was attached to the "Labour theory of Value" in the 18th century and by the 19th century "economics" or the study of the economy using axiomatic principles and fundamental, mathematical techniques gradually superseded the term of "political economy.".

Political economy has now changed from the approaches of the traditional political economy and approaches such as "Mutuality Political Economy" have also evolved. The modern political economy deals with internal cooperation and competition in the field of international trade which might increase or decrease world per capita incomes, global warming, international immigration of skilled labour to the developed countries and the rising inequality in incomes due to globalization in the underdeveloped economies. These burning social, political and economic issues can only be handled effectively under the purview of political economy, or IPE in particular, with proper political will shown by the world polity.

1.10.3 Global Economy

Global economy has shown a conscious shift in economic activity from agriculture to service in both the developed and the developing world. There has also been a growth in total as well as per capita GDP (Gross Domestic Product) mainly in the OECD (Organization for Economic Co-operation and Development) or the advanced countries, Eastern Europe and Asia. However, measuring poverty remains one of the most contentious

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issues and although numbers of people in poverty have declined in East and South Asia, freeing the world totally of poverty still poses the most challenging question.

The global economy has equipped the economy with the power to market goods and services across different countries in the globe. Before the global economy came into existence, the entire economy was ruled. But with the stings of global economy the power of the United States has shrunk to about 25%. The monopoly of United State would continue to lose its vigour as more and more industrialized states come to the force.

Advantages

The global economy can reap the benefits of increasing economies of scale. With the opening up of the economy the industrial sector has benefited with the attainment of cheap labour, capital and technology. Small companies also witness rapid growth owing to a wider customer base. Many opine that the global economy has promoted international peace and cooperation.

Disadvantages

The global economy has encouraged transportation on a wider scale for the free flow of goods and services across nations. This has, in turn, led to the emission of greenhouse gases. The global economy has also resulted in the loss of domestic jobs. The labor-intensive industries of the developed countries find it profitable to shift to third world countries where wage rates are low. This leads to the displacement of labour in the developed countries. Further, it is difficult to formulate regulations and legislations that are undifferentiated across the globe.

1.10.4 Mixed Economy

Mixed Economy can be defined as a form of organization where the elements of both the capitalist economy and socialist economy are found. In a mixed type economy, both the private ownership as well as the state takes part in the means of production, distribution and other types of economic activities. The mixed economy allows private participation in the field of production in an environment of competition with an objective of attaining profit. On the contrary following to the socialism features it includes public ownership in production for maximizing social welfare. Simply in such type of economy there is the presence of private economic freedom with centralized planning with a common goal of avoiding the problems associated with both capitalism as well as socialism. In this system the freedom in the economic activities are influenced by the Government's regulation and licensing policies.

1.10.5 Capitalist Economy

A capitalist economy otherwise called as the free market economy can be defined as an economic activity, where the means of production are privately owned. Most of the economies over the world have enriched their economic system by implementing capitalist norm in the recent years. Here in such form of economy there is no Government interference.

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Characteristics of Capitalist Economic System

The following are the main characteristics of capitalist economic system:

- More private participation in the field of economic activities;
- Free environment to compete in the economy;
- Individuals and firms act for profit motive;
- High freedom for choice to the consumers;
- Government acts as a police state.

1.10.6 Socialist Economy

In case of a socialist economy, the public authority or the Government makes the means of production and distribution.

Characteristics of Socialist Economic System

The following are main characteristics of socialist economic system:

- It's a centrally planned economy.
- It aims at achieving a better distribution of income and wealth.
- Objective is to attain social gain.
- Absence of consumer's sovereignty.

Though a large numbers of nations over the world are in a trend of following the free market system, still the socialist pattern keeps up its dominance. The USSR and some of the European countries have adopted a fully centralized planned economy. In the past most of the countries over the world have relied upon these form of economic pattern. India had also adopted the socialist pattern of economy after getting independence for fostering its economic growth rate. Though the country has opened its doors of the market, still the five-year plans in the country holds its relative importance. Even China had adopted a socialist model after the communist victory in the civil war.

1.11 ECONOMIC GOALS

Economic goals are the conditions of the mixed economy, including full employment, stability, economic growth, efficiency, and equity, that are generally desired by society and pursued by governments through economic policies. The five goals are typically divided into the three that are most important for macroeconomics and the two that are most important for microeconomics.

1.11.1 Microeconomic Goals

Efficiency and equity are the two microeconomic goals most relevant to markets, industries, and parts of the economy, and are thus important to the study of microeconomics.

1. Efficiency. Efficiency is achieved when society is able to get the greatest amount of satisfaction from available resources. With efficiency, society cannot change the way

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resources are used in any way that would increase the total amount of satisfaction obtained by society. The pervasive scarcity problem is best addressed when limited resources are used to satisfy as many wants and needs as possible. While efficiency is indicated by equality between demand price and supply price for a given market, there are no clear-cut comprehensive indicators for attaining this efficiency goal. While it is possible, in theory, to pinpoint what is needed for efficiency, the complexity of the economy makes the task difficult to accomplish in practice.

2. Equity. Equity is achieved when income and wealth are fairly distributed within a society. Almost everyone wants a fair distribution. However, what constitutes a fair and equitable distribution is debatable. Some might contend that equity is achieved when everyone has the same income and wealth. Others contend that equity results when people receive income and wealth based on the value of their production. Still others argue that equity is achieved when each has only the income and wealth that they need. Equity means income and wealth are distributed according to a standard of fairness. But what is the fairness standard? It could be equality. Or it could be the productive value of resources. Or it could be need.

1.11.2 Macroeconomic Goals

Full employment, stability, and economic growth are the three macroeconomic goals most relevant to the aggregate economy and consequently are of prime importance to the study of macroeconomics.

1. Full Employment. Full employment is achieved when all available resources (labour, capital, land, and entrepreneurship) are used to produce goods and services. This goal is commonly indicated by the employment of labour resources (measured by the unemployment rate). However, all resources in the economy—labour, capital, land, and entrepreneurship—are important to this goal. The economy benefits from full employment because resources produce the goods that satisfy the wants and needs that lessen the scarcity problem. If the resources are not employed, then they are not producing and satisfaction is not achieved.

2. Stability. Stability is achieved by avoiding or limiting fluctuations in production, employment, and prices. Stability seeks to avoid the recessionary declines and inflationary expansions of business cycles. This goal is indicated by month-to-month and year-to-year changes in various economic measures, such as the inflation rate, the unemployment rate, and the growth rate of production. If these remain unchanged, then stability is at hand. Maintaining stability is beneficial because it means uncertainty and disruptions in the economy are avoided. It means consumers and businesses can safely pursue long-term consumption and production plans. Policy makers are usually most concerned with price stability and the inflation rate.

3. Economic Growth. Economic growth is achieved by increasing the economy's ability to produce goods and services. This goal is best indicated by measuring the growth rate of production. If the economy produces more goods this year than the last, then it is growing. Economic growth is also indicated by increases in the quantities of the resources—

labour, capital, land, and entrepreneurship—used to produce goods. With economic growth, society gets more goods that can be used to satisfy more wants and needs—people are better off; living standards rise; and scarcity is less of a problem.

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1.12 ECONOMIC RULES

Economic rules are set of *seven fundamental ideas* that reflect the study of economics and how the economy operates. Like driving has a variety of traffic laws, a journey through economics has a few rules of its own. While breaking these seven economic rules will not result in a ticket or jail time, it could limit an understanding of the subject. Following are the main basic rules of an economic:

1. Scarcity. The economic pie is limited. Society has limited resources and unlimited wants and needs. Because there is only so much to go around and everyone wants more than they have, what one gets, another does not. That means that virtually every good produced, every action taken has an opportunity cost.

2. Subjectivity. Prices depend on preferences. The value of goods and services is subjective. Buyers have personal likes and dislikes and are willing to pay different prices for goods. Sellers base prices on production costs which depend on the subjective value that resource owners place on their resources.

3. Inequality. Life is not fair. Resources, goods, services, income, and wealth are not equally distributed. Some people have more than others. Inequality can be caused by differences in natural abilities, parental wealth, the luck of birth, and other factors beyond one's control. Inequality also results from effort, education, training, shrewd decision making, and just plain hard work.

4. Competition. Competition is good. Competitive markets promote efficiency. Competition among buyers in search of products and competition among sellers in search of buyers brings out the best in both—and in the economy. Limited competition on either side is bad for the market and bad for the economy. Limited competition among sellers causes higher prices for buyers. Limited competition among buyers leads to lower prices for sellers.

5. Imperfection. Nothing is perfect and never will be. Society can fix some problems, but not everyone. Seeking perfection from an imperfect world can be frustrating and even counter productive. Markets, a useful way to deal with scarcity in many circumstances, have deficiencies that can be corrected only by government action. Some deficiencies are minor, others are monumental. Governments, however, are also flawed. Government actions intended to fix market flaws are also imperfect. Invariably, the choice in a mixed economy is between the lesser of imperfections.

6. Ignorance. Nobody knows everything. Information is a scarce good. Acquiring information is governed by the same scarcity problem as any production. It requires limited resources that have alternative uses. This imposes an opportunity cost on society. The cost of getting information limits how much anyone can "buy." That is why everyone is ignorant about something. Sellers who have a good usually have more relevant information than buyers who want it.

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7. Complexity. There is more than meets the eye. The world is a complex beast. Society has millions of people interacting in production, consumption, and allocation activities. Every action, every purchase, every production, every sale, has several effects. Some effects are intended and obvious; others are unintended and more subtle. An action that may be good for one person may be just as bad for another.

1.13 CIRCULAR FLOW OF INCOME/MONEY

We have explained earlier that the basic concept of microeconomics is the individual market. However, the basic concept in macroeconomics is the circular flow of income. In an economy, people are engaged in carrying out various economic activities like production, exchange and consumption. While carrying out these activities, they are involved in making various transactions with each other. This gives rise to inter-dependence between them. This interaction and inter-dependence is called the circular flow of income.

1.13.1 Meaning of Circular Flow of Income

As we know, national income is a flow concept. Every year a large number of goods and services are produced which give rise to national income. These goods and services are produced in the production units by combining different factors of production. Producers purchase the factor services to produce goods and services. The national income or output generated is distribution as factor income to the owners of factors of production in the form of wages, rent, interest and profits. Those who receive this income spent it on goods and services produced by production units. The income earned or generated are spent on purchase of goods from these production units. As such, production gives rise to income, income gives rise to expenditure and expenditure gives rise to income again. Thus, in the economy, goods services and factor services are being constantly exchanged between different individuals like producers and households. This flow of goods and services and factor services among producers, households and other individuals in the economy is known as circular flow of income. Thus, circular flow of income is defined as the flow of payments and receipts for goods and services and factor services between different sectors ot the economy.

This flow of national income is circular is nature. There is a constant flow of income and expenditure among different sectors of the economy. Incomes are created in the production units in the process of production. Income flows for production units in the form of factor payments to households and then from households to production units. In this way, income flows in circular way among different sectors of the economy. Goods and services flow in one direction and money payments to acquire these flow in the opposite direction, thereby leading to circular flow. It is called circular because it goes on continuously and indefinitely in a circular way; it has neither any beginning nor any end.

Economic transactions like sale and purchase of goods and factor services generates two kinds of flows, viz. flow of goods and services and money flow. Accordingly, circular flow of income can be viewed from two different angles; real flows and money flows.

Real flows: Real flow of income consists of flow of factor services from the owner of factor services to the producers and flow of goods and services from the producers to the buyers of these goods and services. Thus, real flow consists of flow of factor services and flow of goods and services among different sectors of an economy.

Money flows: In the modern monetized economies, economic transactions involve the use of money. Flow of factor services generates factor income in the form of money. Buyers of goods and services pay in cash for goods and services purchased. Money flows comprise of these flows of money payments. Thus, money flow consists of flow of money incomes for factor services, such as money wages, rent, interest etc. and money expenditure incurred on the purchase of goods and services.

In fact, real flows and money flows are two sides of the same coin. Real flow of goods and services is matched by an equal but reverse money flow. For instance, if a labourer sells his labour service to a producer and thereby earns a wage income of ₹ 5,000 a month, there will be a money flow of ₹ 5,000 in the form of factor income from the producer to the labourer, and at the same time the flow of labour service of the same value from the labourer to the producer. The same is true for the entire economy. National income is both a flow of goods and services and flow of money incomes. The circular flow of income involves the basic principle that expenditure of the buyer creates income for the seller by the same amount. Accordingly, flow of goods and factor of services *(i.e.,* real flows) from the seller to the buyer creates the income or money flow from the buyer to the seller.

Economic Sectors of an Economy

To illustrate and explain the circular flow of income in an economy in a convenient way, the economy is divided into four sectors : (i) household sector, (ii) business sector *i.e.*, the firms, (iii) government sector, and (iv) foreign sector.

Household sector: Households are the main owners of factors of production—land, labour and capital. They sell the services of these factors of producers and in return receive their income. They spend a large part of their income in purchasing goods and services from the producers. However, they save a part of their income and at the same time they pay taxes to the government out of their income.

Business sector or firms: In economics we use the terms business sector, producers and firms interchangeably. Firms hire services of factors of production from households to produce commodities that they sell to households, to other firms, to government or to other countries. Firms are the principal buyers of factors of production and main producers of commodities. Business sector comprises of both private and government enterprises.

Government: Government is taken in the sense of general government so as to exclude government enterprises. General government gets its income largely from taxes imposed on households and business sector in the form of direct and indirect taxes. It buys goods and services from the producers and factor services from the households. It uses these commodities and factor services in providing free services, such as police, education, medical facilities, sanitation facilities, judicial services etc. to the people so as to satisfy their collective wants.

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Rest of the world: Different sectors of the economy have transactions not only with each other, but also with foreign countries, *i.e.*, rest of the world. A country exports goods and services to other countries and similarly it imports goods and services from other countries. In the same way, factor services move across the border of a country and the firms of this country may purchase the factor services from other countries.

In order to study circular flow of income in a simplified way, we combine the above-mentioned four sectors to make the following three models of circular flow:

(i) Two-sector model consisting of the household and the business sectors.

(ii) Three-sector model comprising the households, business and government sectors, known as closed economy model and

(iii) Four-sector model consisting of households, business and government sectors and the rest of the world, and known as open economy model.

These three models of circular flow of income are studied here in detail.

Two-Section Model Without Saving

To understand the basic essence of circular flow of income, we begin with a simplified two-sector model consisting only of households and firms (production units). Thus, we are imagining a hypothetical economy where there is no government and which has no relation with rest of the world. In such an economy the household sector owns all the factors of production. This sector sells the factor services to the firms and receives income from them in the form of wages, rent, interest and profits. The money payments made by firms to households are cost-expenditures for the firms and factor incomes for the households. Firms or the production units use the factor inputs to produce goods and services which are sold to the households. The household sector pays for these goods in the form of money and thereby firms receive money payments from the household. The interaction of firms and households takes place in two sets of markets—factor markets and product markets. Factor markets are those markets where factor services are bought and sold. Product markets and goods markets are the markets where goods and services are bought and sold.

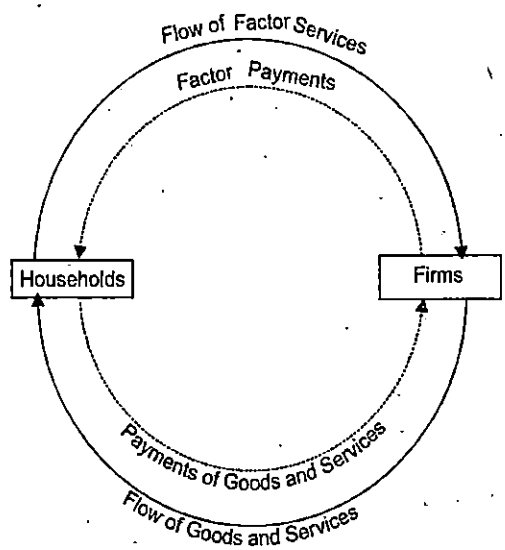

Fig. 1.1. Two-sector models without saving.

The circular flow is better understood by referring to Fig. 1.1 showing the money and real flows in a two-sector economy. In the upper loop, the factor service flow from the households to the firm is indicated by the arrow mark. This is the real flow, in return, money flow from firms to households as factor incomes (is indicated by a dashed arrow). This is the money flow. Flow of factor services from households to firms gives rise to a reverse money flow from firms to households. Factor services are sold by households through factor markets. This leads to a flow of money income from firm to households. In the lower loops, goods and services produced by the firms flow from the firms to households as indicated by the arrow mark. This is the real flow. The households pay for these goods and services in money which creates money flow, indicated by a dashed arrow. Note that flow of goods and services from firms to households gives rise to money flow in the opposite direction from households to firms. Goods and services are sold by firms through product markets. This leads to flow of payments from households to firms.

The outer circle represents the real flows (indicated by solid line) and the inner circle represents money flows (indicated by dashed line). Real flow consists of flow of factor services from households to firms and flow of goods and services from firms to households. Money flows comprise of flow of factor incomes from firms to households and flow of money expenditure on goods and services from households to firms. By combining both types of money flows we find a circularity in the money flows. The money payments go around in a circular manner (as shown by the continuous dashed arrows). In the same way we get the circular flow of goods (real flow) by combining both types of real flows.

In the two-sector model, if households spend all their incomes on buying consumer goods produced by firms, and firms distribute all the money collected from the sale of their products to households as factor income, then the circular flow of income will remain constant. As the households; spend all their income on the purchase of goods and services from the firms, total money receipts of the firms will be equal to the total income of the households. Similarly, total income of the households is equal to the expenditure of the firms on the purchase of factor services. Everything received by households would be passed on to the firms, and everything received by firms would be passed back to households. The circular flow of income will continue to operate at unchanged level. In other words, there would be equilibrium in the circular flow of income.

Two-Sector Model with Savings and Investment

In the foregoing analysis of circular flow of income in the two-sector model we have assumed that there is no saving either by the households or by the firms. We have assumed that household sector spends the entire income on the goods produced by firms and firms distribute all their receipts to the households as factor incomes. However, in reality households do not spend all the income on consumption. Instead, they save part of their income either for old age or to meet expected expenditure like marriage of their children, etc. A part of income which is not spent by households on consumer goods and services, is called savings. Similarly, firms may not distribute all their receipts to household as factor income, rather they may save a part of their receipts in the form of depreciation provisions and undistributed profits which may be used for undertaking investment. How do we illustrate savings and investment in our model of circular flow of income?

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To keep our analysis simple, we assume that all savings are made by the households. The act of saving by the households reduces the consumption expenditure and thus the circular flow of income. Households receive income from firms and pass back only a part of it through consumption expenditure since part of the income is saved. Saving thus represents a sort of withdrawal or leakage of expenditure from the circular flow of income between households and firms. Withdrawal or leakage is the amount of money which is withdrawn from the flow of income. It reduces the flow of income in the country.

However, savings may be used for undertaking investment expenditure. Investment refers to expenditure on goods which helps in producing other goods in the production process. Expenditure on plant, machinery, etc. are example of expenditure. These capital goods are not purchased by the consumers, rather they are purchased by the firm only. In an economy, both consumer goods and capital goods are produced. In our simplified model, we have assumed so far the production of consumers goods only. Now we expand our model to incorporate capital goods. Firms produce two types of goods now. The first types of goods are consumer goods, which are sold by the firms to the households. The second type of goods are capital goods (or investment goods), which are sold by the firms that produce them to the other firms that use them.

Now consider the effect of investment. Investment expenditure creates income for the firms that produce capital goods and for the factors used in production of these goods. This income does not arise from the expenditure of the households, rather it is over and above the income that arises from the households expenditure. Investment expenditure thus results in an addition to the circular flow of income, and as a result the level of income rises. Thus, investment expenditure is an injection into the circular flow of income. An injection is the amount of money which is added to the flow of income. It increases the flow of income in an economy.

How do the firms obtain the required funds for undertaking investment? The firms may use part of their profits *(i.e.,* undistributed profits) for undertaking investment. To simplify our analysis we assume that firms do not retain anything as undistributed profit since the entire income is distributed among households as factor incomes. This implies that investment undertaken by firms is financed through savings of the households. To some extent the firm may borrow directly from households. However, households and firms interact with each other through financial institutions (Capital market) like banks, insurance companies, mutual funds, etc. Financial institutions intermediate between saver and investors or lenders and borrowers. In our simplified model, we assume that whatever is saved by the households is deposited with the financial institutions (capital market) and the firms take loan from these financial institutions to undertake investment. Households are the net lenders as they save part of their income. Firms are net borrowers since they borrow funds to undertake investment. Thus, savings of the household sector flow to the firms in the form of investment through the medium of capital market.

Circular flows of income in a two-sector model incorporating saving and investment is illustrated in Fig. 1.2

In Fig. 1.2 a new sector known as capital market has been added. Now a part of income of the households flows to firms in the form of consumption expenditure and a part of

the income flows to capital market in the form of savings as indicated by the dashed line labelled S. These savings flow to the firms through the capital market to finance investment by firms. The investment flow is shown by the dashed arrow labelled I.

It is important to note that then would be equilibrium in the circular flow of income if the investment expenditure by the firms is equal to the savings of the household sector, As explained above, saving is a leakage from the circular flow of income as a result of which circular flow of income falls. Investment, on the other hand, leads to increase in the circular flow of income. Equality between savings and investment (S = I) means that concretionary effect of saving on the level of income is just equal to expansionary effect of investment on the level of income. Thus, equilibrium condition of circular flow of income is:

$$S = I$$

However, investment is undertaken by the firms, while savings are done largely by households. Therefore, savings and investment in an economy need not necessarily be equal. Whenever savings exceed investment (S > I), the income flow declines. Excess of saving over investment implies that whatever income leaks out from the circular flow in the form of savings is not neutralized by an equivalent injection if the form of investment exceeds savings (I > S), the income flow increases. Excess of investment over savings implies that whatever income leaks out from the circular flow of income in the form of savings is more than neutralized by an injection in the form of investment. This pushes up the level of income in the economy.

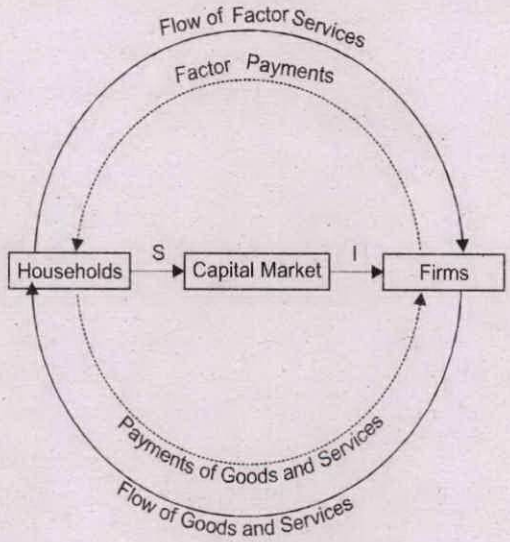

Fig. 1.2. Two-sector model with saving.

Three-Sector Model of Circular Flow of Income : Model with the Government Sector

We have explained the nature of circular flow of income by looking into the primary flow of income between households and firms. Now we expand our model of circular flow of income by adding the government sector to the two-sector model. A three-sector model comprising of households, firms and government is a more realistic model because

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government performs a wide variety of economic functions in a modern economy. Therefore, there is a need of including the activities of the government in the circular flow of income. To keep our analysis simple, we will include three major activities of the government in the circular flows, viz. (i) taxes, (ii) government spending on commodities and factor services, and (iii) transfer payments.

The government imposes taxes both on households and firms. It levied taxes on households in the form of personal taxes and commodity taxes. Income tax on individuals and indirect taxes like sale taxes, excise duties on consumer goods are some of the important taxes levied on households. Thus, a part of the households income flows to the government in the form of taxes. The government imposes taxes on the firms as well. Corporation tax is the most important tax falling in this category. Therefore, a part of the firms earning is taxed away in the form of corporate tax. This gives rise to income flow from firms to the government. Thus, income flows from households and firms to the government in the form of taxes.

The government spends the money collected through taxes to discharge various functions in the economy, such as administration, law and order, etc. The government spends a part of its tax revenue in purchasing factor services from households and making payments to them in the form of wages and salaries. The government incurs expenditure in buying a whole range of goods and services from the firms and make payments in turn. Thus, the government buys factor services from households and goods and services from the firms. Accordingly, income flows from the government to households and firms in the form of government expenditure on factor services and commodities.

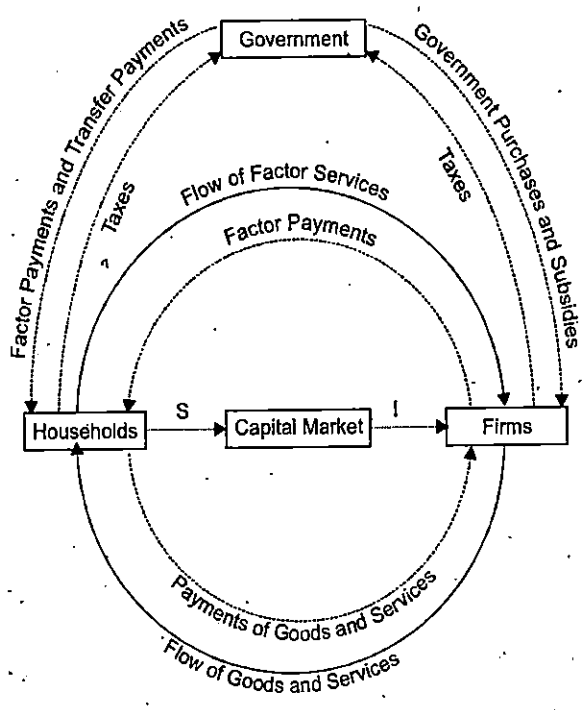

Fig. 1.3. Three-sector model.

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Four-Sector Model of Circular Flow of Income : Model with the Foreign Sector

So far the circular flow of income has been shown in the case of a closed economy. A closed economy is an economy which does not engage in international trade. But the actual economy is an open economy where foreign trade plays an important part. Therefore, we need to include the rest of world sector in our model to make it a realistic model. A four-sector model comprising households, firms, government and rest of the world is known as an open economy modle.

Circular flow of income is an open economy is explained with the help of a flow chart as shown in Fig. 1.4 like Fig. 1.3, this figure also show only the money flow so as to avoid crowding in the diagram. It needs to be borne in mind that each flow has its counterpart real flow in the opposite direction. The lower loop of this figure shows circular flow of income in respect of foreign trade.

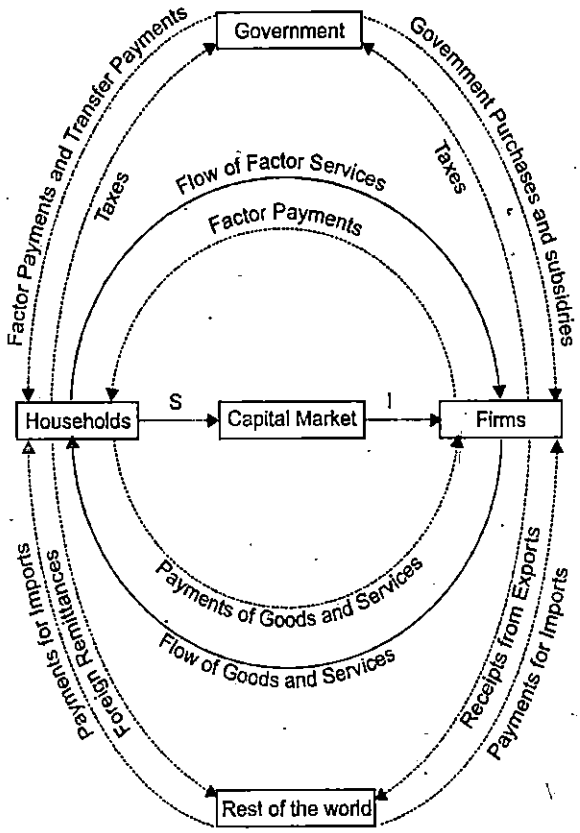

Fig. 1.4. Four-sector model.

Interaction between the domestic economy and rest of the world takes place through flow of goods and services (international trade) and flow of factor services. The household sector buys goods imported from abroad and makes payment to the foreign sector. On the other hand, the households sector receives foreign remittances in foreign exchange by selling some of the factor services abroad. For example, some of the Indian people may be working abroad and they may remit income to their families in India. Thus, there is outflow of expenditure from households to the foreign sector to pay for the imported goods and inflow of income for the services rendered by them in foreign countries.

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The business sector exports goods and services (like shipping, insurance, banking etc.) to foreign countries and receive payment in the form of receipts from exports. On the other hand, the business sector makes payments to the foreign sector for import of goods and services. This is the flow of expenditure out of the economy. Like the business sector, modern governments also export and import goods and services from foreign countries. However, for the sake of simple analysis, we have not illustrated it in the diagram. Similarly, there is inflow and outflow of capital services which are not shown in the diagram for simplified analysis.

Inflow and outflow of income affect the level of circular flow of income. If the inflow of income is equal to the outflow of income, the level of circular flow of income would remain unaffected, *i.e.*, there would be equilibrium in the circular flow of income.

Importance of circular flow of income

The circular flow of income is the basic concept in macro economics. Importance of circular flow of income is evident from the following factors:

1. The entire economic system can be viewed as circular flow of income and expenditure. Circular flow of income shows how different sectors of the economy, namely, household-sector, producing-sectors, government-sector and rest of the world-sector are inter-related and inter-dependent, circular flow of income gives an overview of interaction between different sectors of an economy.
2. The magnitude of these flows determines the size of income. We can, therefore, measure national income from the money flows.
3. The study of circular flow of income pinpoints the conditions of macro economic equilibrium. It spells out the conditions for equilibrium level of income in an economy, for instance, equality between saving and investment is the equilibrium condition in a two-sector model.

1.14 SUMMARY

- Economics has been recognized as a special area of study for over a century.
- The **evolution of economics** deals with different thinkers and theories in the field of economics from the middle age right up to the present day.
- Economics is the *social science* that studies the production, *distribution,* and consumption of goods and services. The term *economics* comes from the Greek for *oikos* (house) and *nomos* (custom or law); thus economics means "rules of the house hold."
- In economics, all those activities that have to do with the creation of commodities, by imparting to raw materials utility, added value, or the ability to satisfy human wants.
- In economics, the allocation of a society's total wealth among various economic groups.

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- Process of using consumer products in order to satisfy desires and real or imagined needs so that the products are used up.
- The term *micro* has been derived from the Greek word *micros*, which means small. In microeconomics attention is concentrated on a very small part of individual units.
- Macroeconomics is a branch of *Economics* that deals with the performance, structure, and behaviour of the *economy* as a whole.
- In General way, economics is a social science which deals with the production, distribution and consumption of goods and services.
- Adam Smith was an important Scottish political philosopher and economist whose famous work Wealth of Nations (1776) set the tone for work on politics and economics for many people even through today.
- **Adam Smith** says, "The self-interested pursuit of wealth may not be individually satisfying but leads to an aggregate increase in wealth that is in the best interests of a nation."
- **Marshall**—*Economics is the study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of material requited for well being.*
- Economics is often described as a body of knowledge or study that discusses how a society tries to solve the human problems of unlimited wants and scarce resources.
- Economic problem is related to the all types of economy rather it is developed, developing or underdeveloped. It is due to the some causes, which are given as under: limited resources, unlimited wants and needs.
- The market economy is characterized by the voluntary exchange of goods and services in the absence of any government intervention or centralized planning.
- Political economy, basically studies the development process of a polity, i.e., whether the polity is undergoing a surplus or a deficit.
- Global economy has shown a conscious shift in economic activity from agriculture to service in both the developed and the developing world.
- Mixed Economy can be defined as a form of organization where the elements of both the capitalist economy and socialist economy are found.
- A capitalist economy otherwise called as the free market economy can be defined as an economic activity, where the means of production are privately owned.
- Economic goals are the conditions of the mixed economy, including full employment, stability, economic growth, efficiency.
- Economic rules are set of *seven fundamental ideas* that reflect the study of economics and how the economy operates.

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- To illustrate and explain the circular flow of income in an economy in a convenient way, the economy is divided into four sectors : (i) household sector, (ii) business sector *i.e.*, the firms, (iii) government sector, and (iv) foreign sector.
- The government imposes taxes both on households and firms. It levied taxes on households in the form of personal taxes and commodity taxes.
- The government spends the money collected through taxes to discharge various functions in the economy, such as administration, law and order, etc.

1.15 REVIEW QUESTIONS

1. 1.Define the following definitions of economics:
   (*a*) Wealth definition
   (*b*) Welfare definition
   (*c*) Scarcity definition
   (*d*) Growth-oriented definition
2. Explain Marshall's definition of economics.
3. Economics is a science of material welfare. Explain.
4. Explain economics is the study of mankind in the ordinary business of life.
5. Describe the differences between Marshall's and Robbins definition of economics.
6. Which is the most satisfactory definition of economics?
7. Describe the nature of economic problems. What are the causes of appearance of economic problems?
8. What do you understand by economic problems? Explain its various causes.
9. What are the central problems of an economy? Explain in detail.
10. Explain the various economic systems.
11. What are the rules of an economy?

UNIT 2: NATIONAL INCOME

NOTES

STRUCTURE

2.1 INTRODUCTION

National income is often considered as the most comprehensive measure of how well the economy is performing. It is necessary and important, therefore, to measure national income of a country so as to have an idea of the performance of the economy. Measuring national income is an extremely complicated and gigantic task. However, economists have devised various ways of estimating national income. In fact, national income estimates are made in every country these days. In India, the task estimating national income is entrusted with the Central Statistic Organization (C.S.O.), a department of Ministry of Planning and Programme implementation. In this chapter, we examine how economists measure a country's national income that is generated from production. *While measuring national income it is important to keep in mind that national income is taken in the sense of 'net national product at factor cost* (NNP_{FC}). However, while estimating NNP_{FC} we would first be required to estimate the gross domestic product (GDP).

Just as doctors take a patient's temperature to find out how sick the patient is, economists use national income statistics to get a quantitative measure of the economy's performance. It is important to know how economists measure a country's national product and national income that is generated from this. However, measurement of national income has always posed problems. It goes to the credit of Simon Kuznets that he has solved many of these measurement problems. In acknowledgment of this contribution, one of the first Nobel Prizes in economics was given to Simon Kuznets.

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2.2 THREE WAYS TO MEASURE NATIONAL INCOME: AN OVERVIEW

We know, in the production process in an economy goods and services are produced by the combination of factors of production. Goods and services produced are distributed as factor incomes to the owners of factors of production. The income earned or generated is spent on the consumer and capital goods. Thus, production gives rise to income, income gives rise to expenditure and expenditure gives rise to income again. Put in terms of circular flow of income, we can distinguish three successive stages or phases of the circular flow:

(*i*) Production of goods and services by producers with the use of productive resources,

(*ii*) Distribution of incomes to the owners of productive resources, and

(*iii*) Expenditure of incomes on the purchase of final consumer and capital goods.

These three phases of production, income and expenditure are shown in Fig. 2.1

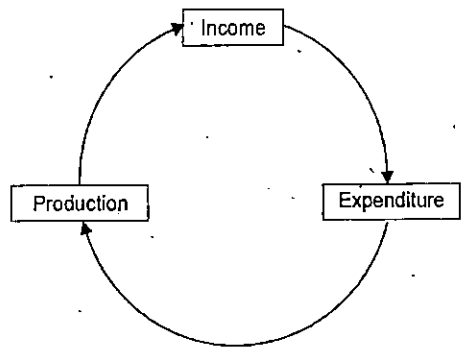

Fig. 2.1. Phases of circular flow.

Corresponding to these three phases of circular flow of income—production, income and expenditure—national income of a country can be viewed in three ways: as a flow of goods and services produced, as a flow of income generated and as a flow of expenditure on goods and services. Accordingly, there are three different ways or methods of measuring national income:

1. Net Product Method or Value Added Method
2. Income Method
3. Expenditure Method.

These three different ways of measuring national income are three different points at which the flow of income round the whole circuit of circular flow of income is measured. All the three methods give the same measure of national income but they refer to conceptually different activities in the economy and provide different ways to look at national income. Therefore, each method is important in its own way.

These three methods of measuring national income are now explained in detail.

2.3 NET PRODUCT OR VALUE ADDED METHOD

The net product or value added method measures national income as the sum total of net final output produced or net value added by all the producing units in an economy during a year.

Value added method involves the following steps:

1. Identifying production units and classifying them into industrial sectors
2. Estimating the net final output or net value added by production units
3. Estimating net domestic output
4. Estimating net factor income from abroad so as to arrive at net national product at factor cost or national income.

We discuss these steps in detail.

Step 1: Classification of Production Units

The net output method requires that national product should be measured industrywise. Therefore, as the first step, the production units are classified into certain groups known as industrial sectors. All the production units in an economy are generally classified into the following three broad industrial sectors on the basis of the nature of production process:

(*i*) *Primary sector*: Primary sector includes all those production units which produce commodities by exploiting natural resources. This sector includes agriculture, forestry, fishing, mining and quarry.

(*ii*) *Secondary sector:* This sector transforms one type of commodity into another type of commodity such as manufacturing cloth from cotton. It includes manufacturing, electricity, gas and water supply.

(*iii*) *Tertiary sector or service sector:* This sector provides various types of non-tangible goods, *i.e.*, services, as compared to the primary and secondary sectors, which produce tangible goods. This sector includes trade, transport and communication, banking, insurance, government and professional services.

These three broad sectors in an economy are further divided into sub-sectors. For example, primary sector is divided into agriculture, forestry, mining, etc. The classification of industrial sectors varies from country to country. However, in India, CSO has distinguished 15 sectors for the measurement of national income.

Step 2: Estimation of Net Value Added by Each Enterprise

The second step in the value added method is estimation of net value added at factor cost by each of the enterprises. National income is the value of final goods and services produced. Therefore, we need to calculate the value of final goods and services produced by each enterprise. We insist on final goods and services so as not to include intermediate products (the value of which is already included in final goods and services) and thereby avoid double-counting. In practice double-counting is avoided by taking the *value added* by each enterprise. *Value added is the value of a firm's output minus the value of intermediate products.* Intermediate products are all goods and services used as inputs into a further stage of production. Value added by a firm is the value the firm adds to the intermediate inputs to get the final output. Thus, Maruti Udyog buys steel, tyres and other inputs and adds value to these inputs by producing a car. When we measure national income by net product method, we count only the value added at each stage of production. Value added by *Maruti Udyog* is the value of cars produced by it less the value of the intermediate goods like steel and tyres used in producing cars.

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The estimation of net value added at factor cost by each enterprise involves the following steps:

(*i*) The estimation of value of gross output by each enterprise is made by multiplying its product by appropriate market prices. This can also be calculated by adding the sales and change in stocks. The value so computed is called 'gross' because it contains many duplicate items in the form of intermediate goods, such as raw materials, fuel, coal, electricity and semi-finished goods. Cost of intermediate goods and services is included in the value of gross output. It is called gross also because it is estimated without deducting depreciation.

(*ii*) Gross value added by an enterprise is calculated by deducting the value of intermediate consumption from the value of gross output. Use of intermediate products for the production of goods and services is called intermediate consumption. We need to deduct intermediate consumption from the value of gross output to avoid double-counting.

(*iii*) Net value added at market price by each enterprise is estimated by deducting the value of depreciation from the gross value added by an enterprise estimated in step (2) above.

(*iv*) From the net value added at market price deduct net indirect taxes (or deduct indirect taxes and add subsidies) so as to arrive at net value added at factor cost by an enterprise.

Thus, Net Value Added at Factor Cost =

Value of Gross Output – Intermediate Consumption – Depreciation – Net Indirect Taxes

Step 3: Estimating Net Domestic Output

By adding the net value added at factor cost by all the producing enterprises in a sector, we get the net value added at factor cost of that industrial sector. The sum total of net value added at factor cost of all the industrial enterprises in the domestic territory of a country gives us the net domestic product at factor cost.

Step 4: Estimating of Net Factor Income from Abroad

The fourth and the final step is to estimate net factor income from abroad. Net National Product at factor cost, *i.e.,* National income is obtained by adding net factor income from abroad to the net domestic product at factor cost.

Thus, National Income = Net Value Added at Factor Cost of Primary Sector
+ Secondary Sector + Tertiary Sector
+ Net Factor Income from Abroad

Precautions in Estimation

While estimating national income by value' added method, the following precautions should be taken:

- *Value of the goods produced for self-consumption,* such as food grains produced by farmers for the consumption by their families, should be included. They are

not sold in the market and therefore do not have market price. Their value is to be estimated or imputed.

- *Own account production of fixed assets*, such as residential buildings by households and factory-buildings by entrepreneurs, should be included.
- We should include the *imputed rent of owner occupied houses.* Many people live in their own houses. They do not pay any rent; they are enjoying housing services similar to the people who are staying in rented houses. To take account of the housing services enjoyed by house owners, value of these housing services is estimated from the market rent of similar accommodation. Such an estimated rent is called imputed rent.
- *Services of housewives, such as cooking meals, looking* after *the* children, are excluded from national income because there is no way of evaluating these services. These services are produced and consumed at home and never enter the market place. For example, meals cooked at home by housewives are similar to meals cooked at restaurants, yet the value added in meals cooked at home is excluded from national income. Similarly, while the value of commercial day care services is included in national income, but taking care of your own child is excluded from national income. In these cases, an imputation is called for in principle, but it is not done in actual practice to keep the things simple.
- National income measures the value of currently produced goods and services. *Sale and purchase of existing commodities or second-hand goods and services* such as old cars, existing houses, old paintings are not included because these transactions have not contributed anything to the flow of goods and services in the current year. We do, however, count the commission of brokers in the sale of these commodities since these services are performed in the current year.
- Sale and purchase of bonds and share are excluded from national income since they only reflect the transfer of an asset, not an addition to the national income. However, services provided by the brokers are included as explained above.

Difficulties in Estimation

Measurement of national income by value added method involves many difficulties. The main difficulties are:

1. Unsold amount of goods add to inventories. Increase in inventories of goods is included in national income because these goods reflect current production of goods and services. However, there is the problem of *valuation of inventories* in view of the changes in prices.
2. Estimation of depreciation also poses a problem, whether it is to be valued at historical cost basis (*i.e.*, the cost price when capital goods were purchased) or replacement cost basis.
3. National income accountants are not very clear whether certain products like education, transport expenses are *final products or intermediate products.*

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4. In many cases, it is not possible to draw a clear-cut line of demarcation between intermediate goods and the final goods. Whether a product is a final product or an intermediate product depends on its use. Flour is a final good for a household but an intermediate product for a baker.
5. Finally, *lack of adequate and reliable data*, particularly in the case of subsistence and unincorporated sectors, is a serious problem in the measurement of national income in underdeveloped countries.

The value added method of estimating national income gives us useful information about national income by industrial origin, *i.e.,* share of different sectors in national income. For example, what is the contribution of the agricultural sector in national income can be known with the help of value added method.

2.4 INCOME METHOD

Goods and services are produced with the help of various factors of production, viz., land, labour, capital, enterprise, etc. Therefore, it is natural that output produced is shared among these factors of production. Factors of production get this share in the form of factor incomes. Factor income is the reward that the factors of production get for their factor services.

The income method measures national income at the phase of factor payments made to primary factors for the use of their factor services. Under this method, national income is calculated by adding up all the incomes generated in the course of producing the national product. National income is taken as the sum total of all the incomes accruing to the primary factors of production used in producing the national product. This method of calculating national income involves the following steps:

1. In the first stage, producer enterprises which employ factor services are identified. These enterprises are classified into various industrial groups, such as agriculture, mining, forestry, manufacturing, electricity, trade, transport and communication, banking, insurance, government and professional services.
2. In the second stage, the factor incomes are grouped under different categories. Factors of production are traditionally classified into four categories, viz., land, labour, capital and enterprise or organization. Accordingly, factor payments comprise rent, wages, interest and profits. However, in national income accounting, factors of production are classified into two primary factors, viz., labour and capital. In some production activities however, labour and capital are provided by the same persons. Accordingly, factor income is classified into the following three broad categories:
   (*i*) Labour income or compensation of employees
   (*ii*) Capital or property income or operating surplus
   (*iii*) Mixed incomes.

Labour Income or Compensation of Employees

Labour income, also known as compensation of employees, is income from work for others. It is the payment to the workers for their labour. It is the payments made by

producers to their employees in the form of wages and salaries and other payments made in cash and kind and social security benefits. Labour income includes:

(*a*) *Wages and salaries in cash*, including bonus, commission, dearness allowance, house rent allowance, travelling allowance to travel to and from the workplace, leave travel concession (LTC), sick leave allowance, etc.

(*b*) *Supplementary labour income* in the form of employers' contribution (not of employees) towards social security schemes for employees, such as provision for pension, provident fund, group insurance, gratuity, etc. It is important to note here that the contributions made by the employees themselves towards social security schemes are not included in the social security contributions while estimation compensations of employees are paid out of wages and salaries.

(*c*) *Payment to employees in kind* like rent free accommodation, free medical, free educational facilities, free or subsidized food, uniforms, free transportation, recreation and holidaying facilities, crèches for children of employees, free provision of goods and services produced by the employees, imputed interest on interest free loans etc.

Thus,

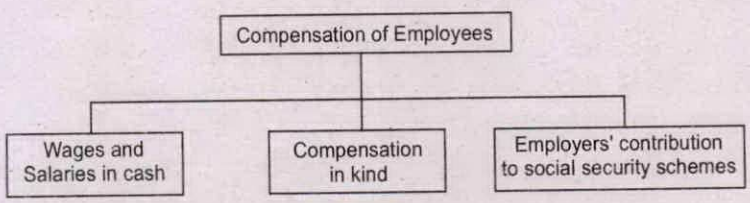

Fig. 2.2. Components of compensation of employees.

Operating Surplus

It is the income earned from the ownership and control of capital. It is also known as income from property and entrepreneurship. Capital income includes rent, interest, royalties, dividends, undistributed profits of corporations before corporation taxes and profits of the government enterprises. *Rental payments* are incomes to people who own land and buildings and rent them out. The rents they receive from their tenants are rental payments. The income from rent includes rent on land as well as rent on buildings. It may be noted that rent of self-occupied houses in the form of imputed rent is also part of rental income. *Royalty income* consists of income received for granting the rights of mining to others and royalties earned from patents and copyrights. *Interest payments* are incomes received from lending to others. It includes interest received from lending to business firms, interest on government bonds (but not on war bonds and consumer credit), net interest paid by commercial banks, imputed interest on life insurance policies.

Income earned by entrepreneurs from entrepreneurship in the form of profits is known as income from entrepreneurship. It includes dividends and undistributed profits. *Dividend* is that part of profit which is distributed to the shareholders of the companies. Large

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companies do not distribute their entire income to the shareholders in the form of dividends. They keep some part of the income with them in the form of '*undistributed profits*'. These undistributed profits are utilized in paying corporate profit tax and are partly kept in the form of corporate saving.

Mixed Income

Mixed income is composed of labour income and capital income of those people who provide both labour and capital services in the production process. Such income is partly labour income and partly capital income. It is mixture of income from work and income from property and entrepreneurship. Mixed income includes the income of own-account workers and income of unincorporated enterprises. Such incomes include earning from agriculture, trading, transport, sole proprietorship, various professions like legal and medical professions and incomes of own account workers like plumbers, carpenters, etc.

3. In the third stage the domestic factor income is estimated. Income paid out by each producer enterprise is estimated by adding together three kinds of incomes, viz., compensation of employees, operating surplus and mixed incomes. Incomes paid out to all the factors of production in a particular industrial sector, such as agriculture, manufacturing, etc. is found out by adding the incomes paid out by each enterprise in that sector. Then we add the incomes paid by all the industrial sectors to get the domestic factor income. Thus, the sum total of compensation of employees, capital incomes and mixed incomes by all the production units in the domestic territory of the economy during the accounting year gives the measure of domestic factor income.
4. In the last stage, net factor income earned from abroad is added to domestic factor income to arrive at national income. Net factor income from abroad, as noted earlier, is the difference between the factor income received from abroad for providing factor services and the income paid for the factor services provided by non-residents in the territory of a country. It is the difference between factor incomes arising out of factor services rendered by the normal resident of a country to the rest of the world less factor incomes arising from factor services rendered to them by the rest of the world. The components of net factor income from abroad are:
   (*a*) Net compensation of employees
   (*b*) Net income from property and entrepreneurship, *i.e.*, net income from interest, rent, ividends and profits; and
   (*c*) Net retained earnings of resident companies abroad.

Thus,

National Income = Compensation of employees + Capital incomes or operating surplus + Mixed incomes + Net factor income from abroad

Precaution in Estimation

- While calculating national income by income method, we should include the following two items since they constitute income in kind:

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(*i*) Value of production for self-consumption, such as agricultural products used by the farmers for the consumption by their families.

(*ii*) Imputed rent of the self-occupied houses by the owners of these houses.

- Imputed value of the services provided by the owners of production units in production process should also be included the following items should not be included in the income for diverse reasons:

All *transfer incomes* (payments) like old age pensions, unemployment relief, scholarships to the students, assistance given by government and other agencies to meet exigencies like flood, drought, etc. should be excluded from national income because they have been received without rendering any productive services in exchange in the current year. Such payments lead only to transfer of income from one pocket to another. These transfer incomes do not reflect any production of foods and services in the current year.

Illegal incomes like income of smugglers, illegal drug traders, gamblers and illegal arm dealers are excluded from national income as they are the result of illegal activities and are unaccountable.

Interest on national debt is excluded from national income since it is treated as transfer income on the assumption that the government borrowings are used for consumption purposes. This is the national income convention as public debt in the past was used for unproductive purposes.

Money income received from the sale of second-hand goods, boundaries, etc. are excluded from national income because they do not can tribute anything to the current flow of goods and services. These as actions reflect only changes in the ownership of pre-existing input. However, the commission charged by brokers on such as actions should be included in the national income.

Private transfer payments, such as pocket money given by parents to their children, money given to elders by their children, etc., are excluded as they are merely transfer of money from one individual to another.

- Windfall gains, such as income from lotteries, should not be included as they do not contribute to current flows of goods and services.
- In calculating national income, we include profits before deduction of corporation tax. Therefore, corporation tax should not be included separately.
- Wealth tax, gift tax, etc., are paid out of current out of past savings. Hence, they should not be regarded as part of national income.

Difficulties in Estimation

Estimates of national income by income method poses various difficulties, the major difficulties are:

1. Firstly, it is difficult to estimate mixed incomes. Mixed incomes are earned by the unincorporated sector, and it is difficult to get reliable information from such an unorganized sector.
2. Interest on national debt is not included in national income as per the national income convention on the assumption that government borrowings are used for

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consumption (unproductive) purpose. However, some economists object to this since a part of the government borrowing is used for productive purposes.

3. Incomes received are generally calculated from income-tax returns. Therefore, income method is of limited use in underdeveloped countries because a very small part of the income earners are tax payers in these countries.

Income method of estimating national income is useful because it provides information about distribution of national income among various factor categories like share of wages and profits, etc. in national income.

2.5 EXPENDITURE METHOD

The third method of calculating national income is the expenditure method; *It measures national income at the disposition stage, i.e., the disposition of final products.* It estimates national income by measuring the final expenditure on gross domestic product. In other words, it measures national income by estimating expenditure on final products. The final products are those which are purchased for consumption and investment. As such expenditure on consumption and investment constitutesthe value of the final products. Expenditure is done by private individuals like households and government. Accordingly, consumption expenditure is classified into private and government final consumption expenditure. Expenditure on investment is done by producers and government within the economy. In an open economy, there is foreign component of expenditure in the form of net exports.

Having understood the basic framework of expenditure, let us explain the expenditure method. Estimation of national income by expenditure method involves the following steps:

1. All the economic units which incur expenditure on final products are divided into four groups:
   (*i*) Households,
   (*ii*) Business sector,
   (*iii*) Government sector,
   (*iv*) Rest of the world.
2. Final expenditure on final goods and services in the economy is divided into four broad categories:
   (*i*) Consumption expenditure,
   (*ii*) Investment expenditure,
   (*iii*) Government expenditure,
   (*iv*) Net exports.

   These four categories of expenditure correspond closely to the four sectors into which the economy is divided as explained in step 1 above.
3. The third step involves the *measurement of the components of final expenditure.* Different components of final expenditure are measured as follows:

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Estimation of Private Final Consumption Expenditure

Private final consumption expenditure comprises of expenditure on the purchase of consumer goods and services (except houses) by households and private non-profit institutions serving households like schools, clubs, charitable hospitals, etc. It is divided into three major sub-categories:

(*i*) Expenditure on non-durable goods, such as food, beverages, etc., which are used immediately or within a short span of time.

(*ii*) Expenditure on durable goods like TVs, cars, etc., which could be used for a longer period of time.

(*iii*) Expenditure on services like transport services, medical services etc.

We calculate the final consumption expenditure by the households and private non-profit institutions serving the households on the domestically produced consumer goods and services by multiplying the volume of sale of these goods and services in the market with the retail prices.

While calculating consumption expenditure, several points should be noted. First, expenditure on purchase of new houses is excluded from consumption expenditure since it is taken as investment expenditure. Second, only currently produced goods and services are included. Expenditure on purchase of old goods like old cars should be excluded because these goods do not represent current output.

Third, production for self-consumption by producers should he included. Production for self-consumption is a part of production and income, and since this part of production is used for consumption by the producers, it is also a part of final consumption expenditure.

Lastly, imputed rent on the self-occupied houses is also included in the final consumption expenditure. By living in their own houses, the owners are consuming or using the housing services.

Estimation of Investment Expenditure

Investment means addition to the physical stock of capital goods, such as machinery, factories, residential houses and addition to a firm's inventories of goods during a given period. Investment consists of investment goods bought for future use. Investment expenditure is the expenditure on investment or capital goods. Capital goods are produced by firms and they may be bought by firms, by households (purchase of residential houses) or by governments.

Investment expenditure is divided into three sub-categories:

(*i*) Expenditure on business fixed investment, *i.e.*, expenditure on the purchase of new plants, machinery, equipments, factories, transport equipments, construction works (like irrigation, dams, telephone lines, etc.) and breeding stock.

(*ii*) Inventory investment, *i.e.*, change in inventories of the firm which are in the warehouses, goods on store shelves, on showroom floors, which have not yet been sold or converted into a final good.

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(*iii*) Expenditure on residential investment, *i.e.,* expenditure on the purchase of new houses by households and landlords.

- *Expenditure on machinery, equipment* (business fixed investment) can be estimated by taking the value of final sales at market prices. Own account production of machinery and equipment by the producers has to be added to get the final expenditure on machinery and equipment.
- *Inventory investment, i.e.,* increase in stock of goods—final goods awaiting sale, semifinished goods, raw materials, etc., with producers and retailers, is calculated at market price. Net increase in stock of consumer goods with households is excluded from inventory investment on the assumption that goods with the consumers are consumed the moment they are purchased. We include inventory investment as an investment item because it represents goods produced but not used for current consumption. Inventory investment in an economy is calculated by taking the difference between the opening stock and the closing stock.
- *Expenditure on residential houses* can be found out by estimating the total money spent on construction of new houses. Total expenditure on new housing is equal to the expenditure on the material inputs like cement, steel, bricks, wood, etc. and factor payments to labour and capital in the form of wages, salaries, rent, interest and profits. Own-account production of houses, expenditure on major repairs and renovations are to be included in the expenditure on residential houses. Housing construction is counted as investment because it provides utility slowly over a long time. However, investment in housing is different from investment in capital goods in that houses are purchased by households while capital goods are purchased by firms.

Thus, expenditure on machinery and equipment, changes in inventories and expenditure on residential housing give us total investment expenditure or gross investment. However, a part of this expenditure is incurred to replace the worn-out capital. *The amount necessary for replacement is called depreciation.* By deducting depreciation from gross investment, we get *nil investment,*

Thus,

Net Domestic Investment = Gross Fixed Business Investment + Inventory Investment + Gross Residential Investment – Depreciation

Estimation of Government Expenditure

The third category of spending is government expenditure. The government expenditures are of two types:

(*i*) Current expenditure on goods and services, *i.e.,* Government final consumption expenditure.

(*ii*) Capital expenditure, *i.e.,* Public investment.

Capital expenditure of the government is generally taken along with private investment expenditure. Therefore, we take here *general government final expenditure.* The final

expenditure of the general government is also known as government final consumption expenditure. It consists of expenditure on administration, defense expenditure, expenditure on maintenance of law and order, expenditure on social welfare services, education, sanitation, etc. The government incurs expenditure in providing these services to the public to satisfy their collective wants. That is why this expenditure is regarded as government final consumption expenditure. Very often government expenditure does not produce marketable products. These government services have no market price. Therefore, there arises the problem of how to value the government services. Government final consumption expenditure is valued in terms of cost to the government since the government services have no market price. The cost of these services to the government is the sum total of compensation of employees and the cost of the goods and services purchased by the government to provide these services. For example, cost of defense services comprises wages and salaries paid to military personnel and cost of military equipments.

Though the government does not sell these services in the market, yet sometimes it charges a very nominal amount as fees from those individuals who get these services. For instance, government hospitals take nominal charges from the patients and government educational institutions charge nominal fees from the students. Such receipts by the government should be deducted from the total cost of these services to arrive at the net expenditure on these services.

It is important to note that a large part of the government expenditure is on transfer payments like social security schemes, unemployment compensation and welfare payments. These transfer payments redistribute existing income and are not made for goods and services produced in the current period. They are therefore excluded from national income as they do not generate any output in the current period.

Estimation of Net Exports

The final spending item is *net exports. Net exports are the difference between the value of goods and services exported to other countries and the value of goods and services imported from other countries.* In an open economy a country has transactions with rest of the world through, among other things, international trade, *i.e.*, exports and imports of goods and services.

A country exports some of its' goods to other countries. For example, India exports tea, coffee, jute and cotton fabrics, cars and bicycles to other countries. A country also exports various types of services, such as shipping, insurance, banking, transport and tourist services. For instance, when foreigners use Indian ships to transport goods and passengers India exports shipping services. There are also exports of goods and services in the form of direct purchases made in the domestic market by non-resident households and others. For example, when tourists come to India from abroad, they make direct purchases in India in the form of purchases of food, handicrafts, transport and accommodation. On the same token, a country imports various types of goods and services from other countries.

Why are net exports added when computing national income through expenditure approach? There are two reasons. First, exports represent foreign spending on domestic goods.

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When foreigners purchase goods and services we produce, their spending adds to the demand for domestically produced goods and services. Goods and services exported to other countries are produced by producers operating within the domestic territory of a country. Hence, exports of goods and services is a part of domestic product. For instance, when goods which India exports are produced in India, they are notcounted in consumption or investment or government purchases in India. Thus, exports need to be added to get a measure of production. The second reason is that expenditure on imports of goods and services is part of the aggregate spending by the residents of a country, though it is a part of the domestic product of other countries. For example, if an Indian household imports a *Toyota car* from Japan, it is included in consumption expenditure even though it is not produced in India. To measure what is produced in India, the expenditure on *Toyota car* must be deducted. Imports must be subtracted to find out what is total production in the economy. Thus, net exports account for domestic spending on foreign goods and foreign spending on domestic goods. Since net exports are exports minus imports, adding net exports to spending is the same as adding exports and subtracting all imports.

The sum total of four items—consumption, investment (net), government spending and net exports is the total final expenditure which gives us net domestic product at market prices. By deducting net indirect taxes, we get net domestic product at factor cost.

In the last stage, net factor income earned from abroad is added to net domestic product at factor cost to arrive at Net National Product at factor cost or National Income.

Thus,

y represents national income,

C stands for consumption expenditure,

In represents net investment,

G stands for government expenditure,

(X – M) represents net exports,

NIT stands for net indirect taxes,

NYA represents net income from abroad.

Precautions in the Estimation

While estimating national income by expenditure method, we need to take the following precautions:

1. All final products should be included irrespective of whether expenditure is incurred on them or not. Many final products are not purchased from the markets and hence no expenditure is incurred on them, but these must be included in the national income. Goods meant for self-consumption, such as farmers consuming part of the food grains produced by them, must be assigned some value based on market prices of the similar products. Similarly imputed value to the owner occupied houses must be assigned because the owners of these houses are consuming the housing services.

2. Expenditure on intermediate products is excluded. The reason is that the value of intermediate goods is already included as part of the market price of final goods in which they are used. To add the expenditure on intermediate goods to the expenditure incurred on the final goods would be double-counting.
3. All expenditures on second-hand goods should be excluded. National income measures the value of currently produced goods. Expenditure on second-hand goods reflects only the transfer in the ownership of these goods; it does not lead to any addition to the economy's output.
4. Expenditure on financial assets like shares and bonds is excluded because it reflects only the transfer in the ownership of these assets.
5. Government expenditure on *transfer payments* is not included in expenditure and therefore national income. Transfer payments are payments which are made without any factor services rendered in return in the current period. Although these payments play an important part in achieving certain social objectives, they do not create current production. Transfer payments are not, therefore, a part of expenditure on final output.

Expenditure method involves the same types of difficulties which arise in the case of value developing countries about expenditure.

The expenditure method provides information about the level of consumption and investment in the economy. It also shows the relative share of private sector and public sector in the total expenditure of an economy.

The main components of national income at the output, income and expenditure stages of calculation of national income are summarized in Table 2.1 and Fig. 2.3 for easy and quick reference.

Table 2.1. Components of net national product at factor cost in all of its three phases.

Output Method	Income Method	Expenditure Method
1. Gross Value added at Market Prices in: (*a*) Primary sector (*b*) Secondary sector (*c*) Service sector	1. Domestic Factor Income: (*a*) Compensation of Employees (*i*) Wages and Salaries (*ii*) Supplementary labour incomes	1. Final Expenditure on Gross Domestic Product (*a*) Private Final Consumption Expenditure (*b*) Government Final Consumption Expenditrue
2. Depreciation	(*iii*) Compensation in kind	(*c*) Gross Domestic Capital Formation
3. Net Indirect Taxes	(*b*) Operating Surplus (*i*) Net Interest (*ii*) Net Rent	(*d*) Net Exports of Goods and Services

	(*iii*) Dividends (*iv*) Undistributed corporate profits (*v*) Profits of Govt. Companies (*c*) Mixed Incomes	
4. Net Factor Income Earned from Abroad	2. Net Factor Income Earned from Abroad	2. Depreciation 3. Net Indirect Taxes 4. Net Factor Income Earned from Abroad
Net National Product at Factor Cost *= 1 – 2 – 3 + 4*	***Net National Product at Factor Cost*** *= 1 + 2*	***Net National Product at Factor Cost*** *= 1 – 2 – 3 + 4*

2.6 THE IDENTITY OF OUTPUT, INCOME AND EXPENDITURE

While calculating national income by using three methods, we have taken national income in the technical sense as the value of output at factor cost. National income can be taken as the value of final output or the incomes generated in producing it or the expenditure needed to purchase it. The three concepts, viz., national product, income generated and total expenditure, are so defined so as to give identity among national product, national income generated and total expenditure. That is,

National Product ≡ Income Generated ≡ Total Expenditure

Here, ≡ (read three-bar as identity) implies that the three magnitudes are equal by definition. The national product produced in an economy generates income claims by the same amount. In terms of national income accounting practice, output produced must be matched by the claims on that output of various factor incomes—wages, interest, rent and profits. In other words, factor incomes must account for all output. Thus, national product is equal to national income generated. Total expenditure is taken to mean the expenditure needed to purchase the national product. That is why national output is equal to total expenditure.

However, in practice national income is calculated by the three methods independently of each other using output data or income data or expenditure data. Thus, they may not give an identical total. That is why different estimates of national income contain a component of statistical discrepancy to reconcile calculations of the three methods.

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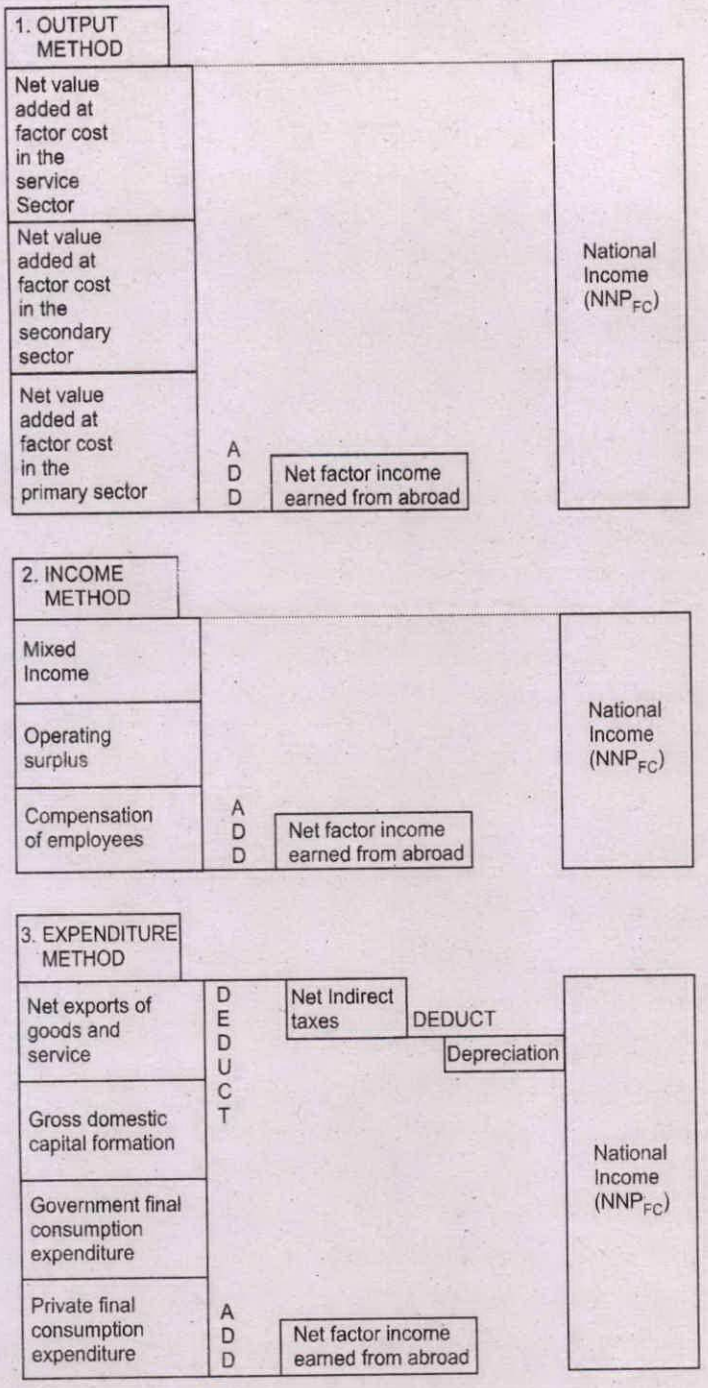

Fig. 2.3. Summary of measurement of national income.

2.7 SIGNIFICANCE OF THE THREE METHODS

Ideally, national income of a country should be measured by all the three methods separately. This is because each method provides a different view of the economy.

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Depending upon which phase of the national income we want to analyze, we can use different methods of estimating national income. If it is viewed from the production phase, such as the relative contribution of different sectors in the net output produced, the net output method is better. For analyzing the distribution phase of income, like how the national product is distributed among factors of production, the income method is used. And if national income is viewed in its expenditure phase like the level of consumption, investment and government expenditure in the economy, expenditure method is more appropriate. But, order to have a complete view of the economy from the point of view of production, income distribution and pattern of expenditure, it is essential to measure national income by all the three methods. Moreover, method provides a cross-check on the accuracy of other methods. In short all the three methods should give us the same national income.

However, most of the countries, particularly developing countries like India, face the problem of inadequate and unreliable data. Hence, they are able to estimate their national income by each method separately. Countries like India do not have complete data for any circular method. Therefore, the usual practice is to combine two or more methods to measure national income. For instance, in India contribution culture is estimated by output method and contribution of small-scale registered manufacturing units is estimated by income method.

2.8 DIFFICULTIES IN MEASUREMENT OF NATIONAL INCOME

National income is quite a complicated task. It is beset with difficulties of various kinds. These difficulties can be broadly classified into two categories:

(*i*) Conceptual difficulties

(*ii*) Practical difficulties.

While conceptual problems are of general nature and appear in almost all the countries, practical difficulties have particular relevance to underdeveloped countries.

Conceptual Difficulties

Conceptual difficulties relate to the definitions of the concepts of National Income. Some of the important conceptual difficulties are:

1. **Inclusion of services:** There is the basic problem of what should be included in output and, therefore, national income. The problem is associated with the inclusion of services in national income. There is difference of opinion as to whether services should or should not be included in the national income. Marxian economists believe that services should be excluded from national income, while others say that services should be included in national income. Both views prevail in actual practice. For example, in socialist countries all services are excluded from the computation of national income. In the capitalist countries and other countries including India, services are included in national income.

2. **Identifying intermediate goods:** As we know, national income comprises final goods and services only; intermediate goods are excluded from national income. However, in actual practice, it is difficult to draw a clear-cut distinction between intermediate goods and final goods. Many goods can be intermediate as well as final goods depending upon their use. For example, flour used by a bakery is an intermediate good, while flour used by a household is a final good, similarly, transport expenditure incurred by a person to reach his office is intermediate cost; but if this expenditure is incurred by him to take his family on holidays, it is expenditure on final goods. It is difficult to decide what part of the expenditure on transportation is intermediate cost and how much of this expenditure is of the nature of final expenditure. Any mistake in identifying cost may lead to overestimation or underestimation of national income.
3. **Identifying factor incomes:** There is also the problem of separating factor incomes from non-factor incomes. National income comprises only factor incomes, *i.e.*, incomes paid in exchange for factor services like wages, rent, interest, etc. Non-factor incomes, *i.e.*, payments received which look like factor incomes but are not actual factor payments, are not included in national income. For example, interest payments on loans taken for consumption, payments received by selling old houses, old cars, sale of shares, etc., are such non-factor incomes. Individuals and businesses mix the two types of incomes and it is difficult in practice to separate the two.
4. **Services of housewives and other similar services:** National income largely includes those goods and services for which payment in money form is made. There are many services for which no payment is made in money form. One of these is services of housewives in their own homes, such as cooking, looking after the household, taking care of children. Similarly, men do many services for themselves and for the family members, such as shaving, are gardening one's own garden, teaching one's own children. No payment is made for these services and, therefore, they are not included in national income. It is difficult to impute the value of these services because there is no statistically sound method of estimating their value and also because these services are performed out of love, affection and regard, which makes their valuation impossible. Therefore, national income convention has followed an easy way out by excluding these services from national income. This method of overcoming this difficulty has led to some anomalies. All these services can be performed by the paid hands, such as maid servant, gardener, tutor, etc. If they are performed by hired persons, national income will increase, though actual output is the same. By the same token, national income of underdeveloped countries is underestimated because these unpaid services are relatively more important in these countries.
5. **Imputing unpaid services:** There are some services rendered without involving any payment. For example, government provides various free services to the people, such as general administration, police, etc. However, there is no record of such free services. Moreover, there is no standard method of imputing the value of these services. In practice, some ad hoc method is used for imputing their value.

6. **Income of the foreign companies:** It is a matter of controversy, whether the income of foreign firms should be included in national income or not. One viewpoint is that the income which the foreign firms retain in the country should be included in national income, and the income which is repatriated abroad should not be included. This is the convention which is normally followed, in case of such incomes.
7. **Valuation of inventory changes:** Inventory valuation is a very difficult and cumbersome job. The problem of inventory valuation is how to take the valuation of stock of goods, whether the valuation should be done at the original cost or at current prices. The practice, however, is to carry out valuation at current prices.
8. **Estimation of depreciation:** Estimation of depreciation is also a very difficult task. Depreciation of a piece of capital can be estimated at its original cost or at its replacement cost. However, the usual practice on the part of the firms is to estimate the depreciation provisions on the basis of the original cost of their assets.

Practical Difficulties

Practical difficulties relate partly to difficulties associated with under-developed stage of the country and partly to non-availability of reliable statistical data. Some of the important practical difficulties are as follows:

1. **Lack of occupational specialization:** For national income calculation it is necessary that producers be classified into various specific occupations. But in developing countries like India, occupational classification of producers into distinct groups is almost impossible, particularly in the agricultural sector. A substantial proportion of working population undertakes more than one activity during a year. This makes the estimation of national income difficult. For example, a small agriculturist may work in the agricultural sector during the cultivation period, in cottage and household industry during the off season, and he may go to the urban area and may work as a casual worker or as a rickshaw puller. In such a case, it is very difficult to assign any particular occupation to him and allocate his income to that particular occupation.
2. **Non-monetized sector:** The large, unorganized non-monetized sector of a developing economy like India serves as the biggest bogey for national income calculation. *Nonmonetized sector refers to that part of the economy where goods and services are exchanged through barter without the use of money.* In a developing economy, agriculture is carried on a subsistence basis. A very large part of production does not come to the market for sale. It is partly kept by producers for their personal consumption and is partly exchanged for other goods. Such goods and services which do not enter the market need to be included in national income. At present there is no objective method of estimating the value of such goods and services. The absence of data about such goods and services makes the imputation all the more difficult. Therefore, estimates of national income have the stamp of guess-work and arbitrary imputation.

3. **Inadequate information regarding income and output:** Another difficulty that arises particularly in underdeveloped countries is that a very large number of producers are not sure of the exact quantity and the value of output they produce. A very large part of production activity in these countries is unorganized, consisting of small farmers, small shopkeepers and small independent artisans. Most of the small producers do not keep account of their production and income. Under these circumstances, the estimates of output and income are simply guess-work.
4. **Unreported illegal income:** Sometimes people distort facts and provide false information about their income to evade income-tax and wealth tax. This leads to generation of black money, *i.e.,* income which is evaded from income-tax, etc. For example, a significant part of the Indian economy operates as the parallel or hidden economy and the income generated there goes as unreported income. Obviously, national income estimates to that extent have an, element of underestimation.
5. **Non-availability of reliable statistical data:** The most important difficulty in the estimation of national income in a developing country like India is the non-availability of reliable data. There are a number of gaps here, which are:
   (*i*) There is a dearth of agencies and statistical organizations collecting national income data.
   (*ii*) A large number of enumerators entrusted with the task of collecting data at the village level are semi-illiterate and untrained, in the collection of data. They do not possess requisite knowledge of collecting, classifying and analyzing data.
   (*iii*) Thirdly, there are also major gaps of data in respect of agricultural byproducts like fruits, vegetables, timber and fire woods. Price on several products like livestock, poultry products are inadequate. Moreover, data in respect of consumption, savings and investment expenditures are incomplete.

The data in many cases are incomplete, full of deficiencies and in some cases non-existent. National income estimates based upon inadequate inaccurate and incomplete data need not be dependable.

2.9 SUMMARY

- National income is often considered as the most comprehensive measure of how well the economy is performing. It is necessary and important, therefore, to measure national income of a country so as to have an idea of the performance of the economy.
- *While measuring national income it is important to keep in mind that national income is taken in the sense of 'net national product at factor cost* (NNP_{FC}).
- National income of a country can be viewed in three ways: as a flow of goods and services produced, as a flow of income generated and as a flow of expenditure on goods and services.

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- *The net product or value added method measures national income as the sum total of net final output produced or net value added by all the producing units in an economy during a year.*
- The income method measures national income at the phase of factor payments made to primary factors for the use of their factor services.
- Mixed income is composed of labour income and capital income of those people who provide both labour and capital services in the production process.
- National Income = Compensation of employees + Capital incomes or operating surplus + Mixed incomes + Net factor income from abroad.
- Net exports are the difference between the value of goods and services exported to other countries and the value of goods and services imported from other countries.
- While calculating national income by using three methods, we have taken national income in the technical sense as the value of output at factor cost.

2.10 REVIEW QUESTIONS

1. How would you treat the following items in estimating a country's national product
   (*i*) Sale of an old car
   (*ii*) Purchase of shares in the stock market
   (*iii*) Services of housewives.
2. How would the domestic product be affected by the following transactions? Give reasons for your answers.
   (*i*) Sale of an old car by its owner and purchase of a new scooter with the money.
   (*ii*) Sale of an old house through brokers who are paid a commission.
3. How are the following treated in national income calculations?
   (*i*) Intermediate goods,
   (*ii*) Pocket allowance of children,
   (*iii*) Owner-occupied houses,
   (*iv*) Pensions,
   (*v*) Income from smuggling.
4. Why are the services of housewives not included in national income? Should they be included?
5. Explain various components of income in the income method of estimation of national income.
6. Why should the following not be included in national income? Give reasons.
   (*i*) Intermediate on national dept,
   (*ii*) Income from the sale of an old TV set,
   (*iii*) Payment of pension by the government to its employees,
   (*iv*) Income of a smuggler.

7. Explain briefly the net output (production) method or value added method of estimating national income.
8. Explain clearly the income method of estimating national income of a country.
9. Explain clearly the expenditure method of estimating national income.
10. Explain various categories in which the final expenditures are divided.
11. Explain briefly different methods of estimation of national income.
12. Discuss the difficulties which arise in the esitmation of national income, particularly in the context of a developing country.
13. Explain any four major difficulties in estimation of national income.
14. Define net income earned from abroad and describe its various components.
15. Explain briefly the basis of classification of production units into primary, secondary and territory sectors.
16. What precautions are necessary while estimating national income by value added method and income method?

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UNIT 3: PRODUCTION

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STRUCTURE

3.1 INTRODUCTION

In economics production is the main activity. First of all one thing is produced and then it consumed. In the common way the term production means the creation of a physical product. Production is simply the conversion of *inputs* into *outputs*. It is an economic process that uses resources to create a commodity that is suitable for exchange. This can include manufacturing, storing, shipping, and packaging. Some economists define production broadly as all economic activity other than consumption. They see every commercial activity other than the final purchase as some form of production.

Production is a process, and as such it occurs through time and space. Because it is a flow concept, production is measured as a "rate of output per period of time". There are three aspects to production processes:

1. The quantity of the commodity produced,
2. The form of the good created,
3. The temporal and spatial distribution of the commodity produced.

A production process can be defined as any activity that increases the similarity between the pattern of demand for goods, and the quantity, form, and distribution of these goods available to the market place. In other way production is the process of transforming the natural resources of the land into consumer satisfying consumption goods or productive capital goods. This transformation process involves the four scarce resources or factors of production—labour, capital, land, and entrepreneurship. Although production is generally the physical transformation of materials, it often involves the spatial relocation, or transportation, of commodities, as well.

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Definitions

Some definitions of different economists related to Production given as under:

Prof. Marshall—*"Man cannot create material things, in mental and moral world, indeed he may produce new ideas when he is said to produce material things, and he really produces utility."*

A.H. Smith—*"Production is a process that creates utility in a good."*

Robert Awh—*"Production may be defined as the process by which inputs may be transformed into output."*

Nichalson—*"Production means an increase in the value of a commodity."*

For example, most people obtain greater satisfaction from driving around in a finely crafted sports car than what they might be able to obtain directly from lumps of iron ore, silicon dioxide, bauxite ore, and other car-making materials buried in the Earth's crust. Most people prefer eating a finely crafted hot fudge sundae than what they might be able to obtain directly from the raw, unprocessed cocoa beans, vanilla beans, almond nuts, and maraschino cherries hanging on their respective trees and bushes.

3.1.1 Production and Consumption

Production and consumption are two related terms. First of a commodity is produced and then it consumed. Production is the process of transforming the natural resources of the land into consumer satisfying consumption goods or productive capital goods. This transformation process involves the four scarce resources or factors of production—labour, capital, land, and entrepreneurship. Although production is generally the physical transformation of materials, it often involves the spatial relocation, or transportation, of commodities, as well. Consumption is the use of resources, goods, or services to satisfy wants and needs. At the macroeconomic level, consumption is reflected as expenditures by the household sector on gross domestic product. At the microeconomic level, consumption is important to utility, demand, and market exchanges. Consumption is the ultimate goal of economic activity. The term consumption arises in three related concepts.

- **Consumption.** This is the generic term for the use of goods and services to satisfy wants and needs. This activity may or may not involve actual purchases or expenditures.
- **Consumption Expenditures.** This is the more specific term referring to actual expenditures by the household sector on final goods and services, or gross domestic product. While the motivation behind consumption expenditures is generic consumption and the satisfaction of wants and needs, such is not guaranteed. That is, some consumption expenditures are for goods and services that do not provide satisfaction.
- **Personal Consumption Expenditures.** This is the official measure of the consumption expenditures component of aggregate expenditures used in the calculation of gross domestic product. While the official number-crunchers try to measure all consumption expenditures, some are missed by the official calculation.

Production is the way of creating utility in a good, by which it become useful to us. There are some methods or techniques of creating utility in a good or service which are given as below:

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3.1.2 Techniques of Creating Utility

Utility is created in a good or service by the following methods or techniques:

1. Place Utility. Place Utility is the value given to a product by virtue of the fact that it is where it is wanted. It means that by changing the place of a commodity its power of satisfying the wants and need is increased. The resources are used in the transportation are use to create place utility in a commodity. For example, woolen clothes are more needed in the cold places.

2. Form Utility. Form utility is related to the change in the form of a commodity and makes it more useful. All activities used to change the appearance or composition of a good or service and making it more attractive to potential and actual users. For example, changing the shape of wheat into bread etc.

3. Time Utility. Time utility of a good or service created by its availability at a particular time. By providing a right commodity at a right time to make a commodity more useful. For example, availability of woolen clothes in winters.

4. Possession Utility. Possession Utility is value given to a product by virtue of the fact that the purchaser has the legal right to own and use it freely. For example, the sewing machine has more utility for tailors than a stockiest of machines.

5. Information Utility. Information utility is that by which the right information is provided to the users and make the commodity more useful. For example, information about the availability of a commodity in the market.

6. Service Utility. Service utility is that service by which the wants of a person is satisfied. For example, the service of a doctor, teacher etc.

7. Knowledge Utility. Knowledge utility is that by which the knowledge to the customers are improved about the commodity. For example, advertising media.

3.2 FACTORS OF PRODUCTION

Resources required for generation of goods or services, generally classified into four major groups: (1) Land (including all natural resources), (2) Labour (including all human resources), (3) Capital (including all man-made resources), and (4) Enterprise (which brings all the previous resources together for production). These factors are classified also as management, machines, materials, and money, or other such nomenclature. More recently, knowledge (know how) has come to be recognized as distinct from labour, and as a factor of production in its own right.

The inputs or resources used in the production process are called factors by economists. The myriad of possible inputs are usually grouped into four or five categories. These factors are:

1. Land
2. Labour services
3. Capital goods
4. Entrepreneur
5. Organization

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The factors of productions are explained below:

Labour. Labour is the mental and physical efforts of humans (excluding entrepreneurial organization) used for the production of goods and services. Labour includes both the physical effort of factory workers and farmhands often associated with labour, as well as the mental effort of executives and supervisors.

Capital. Capital is the manufactured, artificial, or synthetic goods used in the production of other goods, including machinery, equipment, tools, buildings, and vehicles. Capital is the produced factor of production. This factor must be produced using other factors of production, which means that society is often faced with the choice between producing consumption goods that satisfy wants and needs and capital goods that are used for future production.

Without capital, labour would do all production "by hand." The key role of capital in the production process is to make labour more productive. While a covey of construction workers might be able to fabricate a four-bedroom house with nothing but bare hands, an assortment of hammers, saws, and other tools is bound to make their work easier and more productive.

Land. Land is the naturally occurring materials of the planet that are used for the production of goods and services, including the land itself; the minerals and nutrients in the ground; the water, wildlife, and vegetation on the surface; and the air above. The natural resources and materials of the land become the goods produced. Without these materials of the land, there is no production. Production is, in fact, the basic process of transforming naturally occurring materials that provide little satisfaction in their natural state, to goods and services that provide more satisfaction.

Entrepreneurship. Entrepreneurship is the special sort of human effort that takes on the risk of bringing labour, capital, and land together to produce goods. Entrepreneurship is the factor that organizes the other three. Without someone to organize production, the other three factors do not produce. A key component of entrepreneurship is risk. This resource takes the risk of organizing production before anything is produced and with no guarantee that production will be successful.

3.2.1 Land

Land in economics comprises all naturally occurring resources whose supply is inherently fixed (*i.e.*, does not respond to changes in price), such as geographical locations (excluding infrastructural improvements and "natural capital", which can be changed by human actions), mineral deposits, and even geostationary orbit locations and portions of the electromagnetic spectrum. In classical economics, it is considered one of four factors of production (along with capital, labour and enterprise). Income derived from ownership or control of natural resources is often referred to as rent.

Land was sometimes defined in classical and neoclassical economics as the "*original and indestructible powers of the soil.*"Georgettes hold that this implies a perfectly inelastic supply curve (*i.e.*, zero elasticity), suggesting that a land value tax that recovers the rent of land for public purposes would not affect the opportunity cost of using land, but would instead only decrease the value of owning it. This view is supported by

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evidence that although land can come on and off the market, market inventories of land show if anything an inverse relationship to price (*i.e.*, negative elasticity). And although land (especially in the form of, *e.g.*, mineral deposits) must first be discovered in order to have value or be put to use, it is generally conceded that the fruits of scientific discoveries, whether of natural laws or of mineral deposits, cannot rightly be monopolized for purposes of private economic rent capture.

Meaning of Land

Land means everything in the universe that is not created by human beings. It includes more than the mere surface of the earth. Air, sunlight, forests, earth, water and minerals are all classified as land, as are all manner of natural forces or opportunities that are not created by people. Labour uses capital on land to produce wealth. Every tangible good is made up of the raw materials that come from nature—and because all people (and other living things) have material needs for survival, everyone must have access to some land in order to live.

A part of the earth's surface, considered as land. Land is the natural resources available for production. Some nations are endowed with natural resources and exploit this by specializing in the extraction and production of these resources—for example, the development of the North Sea Oil and Gas.

Only one major resource is for the most part free—the air we breathe. The rest are scarce, because there are not enough natural resources in the world to satisfy the demands of consumers and producers. Air is classified as a free good since consumption by one person does not reduce the air available for others—a free good does not have an opportunity cost.

A life on the ocean wave,
A home on the rolling deep,
For the spark the nature gave
I have there the right to keep.
They give me the cat-o'-nine
Whenever I go ashore.
Then ho! For the flashing brine —
I'm a natural commodore!

Definitions

Some definitions of different economists related to Land given as under:

Marshall—*"By land is meant not merely land in the strict sense of the word, but the whole of the material and forces which nature gives freely for man's id land and water, in air, light and heat."*

H.A Smith—*"Land applies to all those gifts of nature which man uses in providing the things that satisfy his wants."*

J. Ulmer—*"Land consists of all economic goods, wealth supplied by nature, natural resources in their original states."*

Richard—*"Under the term land, the economists include not only the soil, but also water, sunshine and all the gifts of nature."*

Merlin—*"You are the land. The land is you."*

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Land is defined as everything in the universe that is not created by human beings. It includes more than the mere surface of the earth. Air, sunlight, forests, earth, water and minerals are all classified as land, as are all manner of natural forces or opportunities that are not created by people. Labour uses capital on land to produce wealth. Every tangible good is made up of the raw materials that come from nature — and because all people (and other living things) have material needs for survival, everyone must have access to some land in order to live. Land is the passive factor in production. As such, land simply exists.

Features of Land

Land is an important factor of production which possess some important features which distinguish it from other factors of production.

1. **Land is a Free Gift of Nature.** An important feature of land is that it has been provided free of cost to man by nature. Unlike capital land is not a produced means of production created by man. No doubt, man has tried to improve its productivity through the use of better technology and has thus increased its production potential but he has not able to completely modify its nature. For example, a poor soil and a bad climate of a region are great obstacles in the way of expanding agriculture and industrial production.
2. **Land is Inelastic in Supply.** The total area of land is fixed. It is limited in supply. Therefore land cannot be produced in response to greater demand for it. This cannot be increased or decreased. So land is inelastic in supply.
3. **Land is Permanent and Indestructible.** Another important feature of land is that unlikely other factors it is considered as permanent and indestructible. However, in this modern age of nuclear science permanency and indestructibility of land and make it unfit for cultivation of crops. Even it is difficult for man to live in the area affected by nuclear rays. However, it has been pointed out that destruction caused by nuclear bomb can be cured and some natural powers of land can be restored after some time.
4. **Land Lacks Mobility.** Land cannot be lifted bodily from one place to another. It therefore lacks geographically mobility. However, it can be put to alternative uses which provide some mobility to it. Beside, its products can be moved to other place which also imparts virtual mobility to it.
5. **Land is of Different Variety.** All pieces of land are not identical but vary in the quality and location. Some land is sandy and some is rocky in nature. Further, fertility of land at different places differs a good deal. Soil at some places is fertile, at others it is infertile. Again differences in location causes differences in their value. Value of land near market is higher than that located far away from them.

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6. **Land is Passive Factor.** Land is a passive factor of production. It cannot produce anything itself. Man need to work on it. Petroleum cannot come out itself from inside the land, so it is called passive factor of production.

Importance of Land

The naturally occurring resources used in the production of goods and services, including the land itself; the minerals and nutrients in the ground; the water, wildlife, and vegetation on the surface; and the air above. Land also includes the productive dimensions of space and accessibility. This is one of four basic categories of resources, or factors of production. Some importances of land are given below:

1. **Use for Economic Development.** In the economic development all the natural resources play an important role. Like coal, petroleum products are the most usable natural resources, they play an important role in the economic development of a country.
2. **Use for Primary Occupation.** Primary occupation like farming, agriculture, fisheries, dairying, animal-husbandry etc. takes place on land.
3. **Use for Industry.** All the manufacturing industries are getting the raw material from the land like coal, minerals, metals, raw cotton etc.
4. **Use for Employment.** In the underdeveloped or developing countries one third of the population are depends on the primary occupation like agriculture, fisheries, dairying, animal-husbandry etc.
5. **Use for Power.** All the sources of power like thermal power, hydro-power, diesel, coal, oil etc. are used from land.
6. **Use for Trade.** The products are found on the land are mostly traded between different countries like leather, wool, tea, jute, milk, butter, petroleum, minerals etc.
7. **Use for Transport.** There are three modes of transport like roads and railways, waterways, airways. They are manly based on the surface of the earth.

3.2.2 Labour

The collective or generic name given to all the various productive services provided by human beings, including physical effort, skills, intellectual abilities and applied knowledge. Although a market society with a complex division of labour involves hundreds or even many thousands of discrete types of labour differentiated according to the kinds of skills and abilities required (each with their own separate but interconnected labour markets), economists often find it useful for theorizing to simplify the real situation by speaking as though there was only one homogeneous kind of labour to be considered, with this single factor of production being freely and easily substitutable across all different alternative production processes for all different sorts of goods and services. Labour is the mental and physical efforts of humans (excluding entrepreneurial organization) used for the production of goods and services. Labour includes both the physical effort of factory

workers and farmhands often associated with labour, as well as the mental effort of executives and supervisors.

Labour is the human input into the production process.

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Definitions

Some definitions of different economists related to Labour given as under:

Marshall—*"By labour is meant the economic work of man, whether with hand or head."*

A.H. Smith—*"Labour includes all the efforts made by man to earn a living."*

Jevons—*"Labour is any efforts of mind or body undertaken partly or wholly with a view to some good other than the pleasure derived directly from the work."*

Thomas—*"Labour connotes all human efforts, of body or mind, undertaken in the expectation of rewards."*

Types of Labour

The labour is divided into the different categories on the bases of the work, qualification, training etc. Some kinds of labour are given below:

1. **Trained Labour.** The labour which get training and skills for performing their work are called trained labour or skilled labour. For example, engineer, doctor etc.
2. **Productive Labour.** Productive labour is that labour which is help in the satisfaction of our needs and wants. This kind of labour contributed to increasing society's wealth, as against activities which do not produce a vendible commodity which can be resold at a profit. Such labour creates utility in the goods and services. It produces both material and non-material goods.
3. **Unproductive Labour.** Unproductive labour is defined as that which does not achieve there target. This type of labour does not create utility in the goods and services, so such labour does not satisfy our wants and needs.
4. **Physical Labour.** Physical labour is also called manual labour. Manual labour is physical work done with the hands, especially in an unskilled job such as fruit and vegetable picking, road building, or any other field where the work may be considered physically arduous, and which has as a profitable objective, usually the production of goods.
5. **Psychological Labour.** The labour that performed there work with the help of brine is called mental labour or psychological labour. For example, the service of a doctor, professor, engineer etc.
6. **Untrained Labour.** The labours which are worked without training and skills are called untrained labour or unskilled labour. For example, luggage by a coolie and washing of dishes by a housemaid.

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Characteristics of Labour

Whereas land and capital are material factors of production, labour is a human factor. Because of this, labour should not be treated as saleable commodity like land and capital. Labour exhibits the following characteristics:

1. **Labour cannot be separated from the labourer himself**, whereas land and capital are distinct from their owners, *i.e.*, landlords and capitalists.
2. **The labourer does not sell himself,** he sells only his labour. It was only when the slavery system privileged that labourers were sold and purchased. But in modern times workers sell only their labour in returns for wages but not their persons as such.
3. **Labour is a perishable factor** and it is not possible to store it for future use. If a worker does not get employment for some days, then the so loss cannot be recovered. The labour time lost once is lost forever.
4. **Labour lacks mobility**. It is less mobile than even capital. This is because labourer is a human being with all his feelings of affection and attachment with the place he is presently residing and with the friends and relatives who live there. It is difficult to leave and shift from one place to another. However, despite this, some workers do migrate from one part of a country to another or even from one country to another in search of their livelihood.
5. **Supply of labour is elastic** but it takes time to increase its overall supply by expanding population and providing them suitable training and skills required.
6. **Efficiency of labour varies a good deal**. Some workers are more efficient than others. The difference in efficiency is caused by their physical and mental capabilities as well as by training and skill imparted to them. Their productivity differs also because of different quantity and quality of capital equipment used by them and different technologies with which they work.

   The contribution to the labour to the national product and income depends not only on the size of labour force but also on its quality. By quality of labour we mean how much productive it is, that is, what is its level of productivity. Therefore, an important factor determining the efficiency of labour force is the division of labour.

Importance of Labour

Labour is an important factor of production. Without labour no production takes place. Some importances of labour are given below:

1. **Source for Production.** Labour is a dynamic and indispensible source of production. The consequence of labour is capital and organization. If you have machines, raw materials and technologies but not the labours, than you cannot produce goods and services. That's why labour plays a vital role in the production.
2. **Source of Consumption.** The production of goods and services takes place for their consumptions. All the productions are made for satisfying the needs and wants of the labour. A labourer spent a large amount of his income on

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consumption as compared to a rich person, as the income of labourer is increases they demand more goods and their living standard rises.

3. **Source of Exchange.** A labourer cannot satisfy his needs and wants him. That's why labour is a good source of exchange. If someone produces wheat, he depends on others for the supply of clothes, milk, footwear etc. Higher the purchasing power of labours, better the will be the amount of exchange.
4. **Source of Distribution.** Distribution of goods and services amoung different factors is the main activity of economics. Supply, demand, *i.e.*, marginal productivity decides the factors on which total production depends. If the labour is trained and hardworking he can turn barren land into a fertile one and thereby increase the productivity. Increase in total production results in the increase of national revenue.
5. **Source of Economic Development.** Efficiency, hard work and skills of labour results in economic development. Utilization of country's natural resources depends on the efficiency of labour. For example, if the efficiency of one state's labourers is more than other, then their per capita income will be much greater than the later, which ultimately leads to a country's economic development.

3.2.2.1 Division of Labour

The division of labour is an important feature of modern economics. Division of labour occupies so important a place in the modern productive process and adds so greatly to the total output and wealth of a country. According to **Adam Smith**, "the father of economics" economic growth is the root of increasing division of labour. This idea relates primarily to the specialization of the labour force, essentially the breaking down of large jobs into many tiny components. Under this regime each worker becomes an expert in one isolated area of production, thus increasing his efficiency. The fact that labourers do not have to switch tasks during the day further saves time and money. Of course, this is exactly what allowed Victorian factories to grow throughout the nineteenth century. Assembly line technology made it necessary for a worker to focus his or her attention on one small part of the production process. Surprisingly, Smith recognized the potential problems of this development. He pointed out that forcing individuals to perform mundane and repetitious tasks would lead to an ignorant, dissatisfied work force. For this reason he advanced the revolutionary belief that governments had an obligation to provide education to workers. This sprung from the hope that education could combat the deleterious effects of factory life. Division of labour also implies assigning each worker to the job that suits him best. Productive labour, to Smith, fulfills two important requirements. First, it must "lead to the production of tangible objects." Second, labour must "create a surplus" which can be reinvested into production.

The division of labour means that the making of an article is split up into several processes and each process is carried out by a separate worker or a separate group of workers.

Definitions

Some definitions of different economists related to Division of Labour given as under:

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Marx and Engels—*"How far the productive forces of a nation are developed is shown most manifestly by the degree to which the division of labour has been carried."*

A.H. Smith—*"the division of labour is defined as the system wherein the operations necessary to make a finished product are so minutely divided that each worker performs only one or at most only a few simple operations."*

Watson—*"Production by division of labour consists in splitting up the productive process into component parts."*

J. Ulmer—*"Division of labour is the system of production in which individuals specialize in functions that are complementary."*

Advantages

The division of labour has a large number of advantages. Some of them are given as under:

1. **Increase in Productivity.** The main advantage of division of labour is that it increases the productivity per worker. If the work is divided between the workers then they performed with their full capacity to complete the task. By that the workers are becoming expert in their work and it causes increase in the productivity.
2. **Right Man in Right Place.** Another important advantage is that the worker under division of labour is allotted according to the ability and capability of an individual. This ensures a high degree of efficiency as the right man is put in the right job.
3. **Cheaper Goods.** Another important advantage of division of labour is that the economies of large scale are reaped. The cost per unit tends to fall down when the commodity is produced on a large scale which ensures the production of cheaper goods.
4. **Dexterity and Skills.** The worker become highly skilled and acquires high degree of dexterity because of the repeated performance of the same operation. As the age-old dictum does, practice makes a man perfect. The worker acquires perfection in his skill because he has to carry out the same operation over and over again.
5. **Saving in Time.** Under division of labour, a worker perform a part of the whole process and therefore he needs to learn only that much. Long period of training are, therefore, rendered unnecessary. This saves great time and money.
6. **Economy in the Use of Tools.** A worker is not provided with a complete set of tools required for the whole process. He is provided with only those tools which are required by him for the performance of that part of the process which is allotted to him. Thus, one set of tools can be made use of by many workers. This is a great economic gain.
7. **Inventions are Facilitated.** Another advantage is that it promotes the development of new ideas and better techniques of doing the work. It is due to the fact that

when a worker is performing the same operation over and over again, he can think of doing that process in a better and improving manner. Even some machine devices may occur to him to do that process in a batter and improving manner. Thus, division of labour results in the invention of new machinery and better tools.

8. **Use of Machinery Increase.** By breaking up the production of a commodity into small and simple operations, division of labour encourages the use of machinery and its introduction. These simple operations can be carried out by suitable machines.

Disadvantages

Everything in the world has advantages and followed by the disadvantages. Some disadvantages of division of labour are given below:

1. **Lack of Motivation.** The quality of labour decreases while absenteeism may rise.
2. **Loss of Flexibility.** Workers have limited knowledge while not many jobs opportunities are available.
3. **Growing Dependency.** A break in production may cause problems to the entire process.
4. **Higher start-up Costs.** High initial costs necessary to buy the specialist machinery lead to a higher break-even point.

3.2.3 Capital

In economics capital is used in various senses. In the ordinary language capital is used in the sense of money. But when we talk of capital as a factor of production, it is quit wrong. We know money is used to purchase various factors such as raw materials, labour, machinery which help in the production of goods and services. But money does not directly help in the production process.

In other way the existing stocks of goods which is to be used in the production of other goods or services and which has itself been produced by previous human activities. Capital is conventionally subdivided into "fixed capital" and "circulating capital," although the distinction is mainly a matter of degree of durability rather than a clear-cut difference in kind. Fixed capital refers to durable producers' goods such as buildings, plant and machinery, while circulating capital refers to stockpiles of materials, semi-finished goods, and components that are normally used up very rapidly in production. Notice that "capital" in the strictest economic sense refers only to real, physical means of production already in being, not to the sums of money put aside through savings to purchase real capital within the future (although the total amount of capital in a particular firm may for convenience be described or summarized in monetary terms by the potential resale values of all the separate items of capital added together in one grand sum).

Definitions

Some definitions of differents economist related to Capital given as under:

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Marshall—*"Capital consists of those kinds of wealth other that free gifts of nature which yields income."*

Thomas—*"Capital forms part of that wealth of individuals in and of communities other that land which is used to assist in the production of further wealth."*

Chapman—*"Capital is wealth that yields income or aids in the production of an income or in intends to do so.*

Characteristics of Capital

The important characteristics of capital as a factor of production are given below:

1. **Human Made Factor.** Capital is produced by human, so capital is a human made factor of production. Like land it is not a free gift of nature. The wealth which is used for further production is called capital.
2. **Capital is a Minor Factor of Production.** Land and labour are the major factor of production and capital is a minor factor of production. Production of wealth is takes place without capital, so it is called minor factor of production.
3. **Capital is Moveable.** Capital can be moved from one person to another or from one place to other place, so it is called moveable.
4. **Reduction.** Reduction means decrease in the value. Continues use of capital means reduction in its value. It is also called deprecation. Some capitals are depreciated quickly than others. This is happed with time, so capital equipments are replaced with time.
5. **Capital is Portable.** Capital is more mobile or portable than the other factors of production like land and labour. It can easily moved from one place to the other place, according to there use.
6. **Passive Factor.** Capital is a passive factor of production. It can produce nothing without help of labour. As the time is pass some automatic machines are comes in the production process, which reduce the use of labour.
7. **Capital is not a Free Gift of Nature.** Like land, capital is not a free gift of nature. It is a man-made factor of production.
8. **Change in Use.** As compare to the other factors of production the use of capital can be easily increase or decrease. In the other way the use of land cannot be easily increase or decrease.

Types of Capital

Capital is classified or divided into two categories *i.e.*, Real capital and financial or money capital. Which are explained as under:

1. Real capital
2. Financial or money capital

The explanation of two type of capital are given below:

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1. Real Capital

Real capital defined as equipment and machinery, which is used to produce goods and services. Real capital may include shovels for gravediggers, sewing machines for tailors or machinery for manufacturing firms. Real capital can be classified as below:

1. **Fixed capital.** Fixed capital is usually defined as the stock of tangible, durable fixed assets owned or used by resident enterprises for more than one year. This includes plant, machinery, vehicles, and equipment, the value of land improvements, and buildings. Land itself is not included in fixed capital even though it is a fixed asset, because it is not a product (a reproducible good).

Factors which influence Fixed-capital requirements

- *The nature of the undertaking.* The nature of the business certainly plays a role in determining fixed capital requirements. A florist, for example, needs less fixed capital than a vehicle-assembly factory.
- *The size of the undertaking.* A general rule applies: the bigger the business, the higher the need for fixed capital.
- *The stage of development of the undertaking.* The requirement of capital for a new undertaking is usually greater than that needed for an established business that has reached optimum size.

2. **Circulating capital.** It refers to a kind of physical Real Capital, *i.e.*, short-lived items that are used in production and used up in the process of creating other goods or services Circulating capital is a component of the technical capital that participates and integrally consumes in a single cycle of production. It always needs replacing at every cycle (raw materials, basic and intermediate materials, combustible, energy...). In accounting, the circulating capital reflects under the form of circulating actives.

3. **Floating capital.** Working capital or that part of capital that is invested in current assets of the organization (current liabilities) as opposed to its fixed or other capital assets. Floating capital is also a kind of real capital. It encompasses (1) the raw materials consumed in each phase of manufacturing; (2) money designated for wages; and (3) products stored in the warehouses of manufacturers or merchants.

4. **Suck capital.** Such capital is defined as that capital which is purchase for only one type of use. For example, railway lines are only use for rail coaches not for buses.

5. **Production capital.** Production capital is defined as all the goods including labour used in the production. It is used in the direct manner in the production process. For example, raw-material, tools, machinery etc.

6. **Compensation capital.** The wages and salaries paid to the labour and the other employees is called compensation capital.

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7. **Private capital.** The private capital is defined as that capital which is owned by an individual. It is of two type like (a) owned by an individual, (b) owned by some persons jointly.

8. **Public capital.** The capital is owned by the public organization or government is called public capital. For example, Haryana electricity board, Rajasthan roadways etc.

9. **Social capital.** Social capital is defined as that capital owned by entire society. It is useful for the all the persons lived in the society. For example, schools, colleges, hospital and shopping complexes etc.

2. Financial Capital

Financial capital, or economic capital, is any liquid medium or mechanism that represents wealth. It is not directly participate in the production process. Financial capital is the things that have value, but do not do anything by themselves. They are only valuable because people want them. For example, money is a form of financial capital. You cannot do anything with money but it still has value. Financial capital is used to pay for things, this is because there is always more of it and people always want it. This means that financial capital has a stable value and can be traded in most places and with most people.

Financial capital, such as stocks, gold or bonds is not wanted by everybody. However, they can be traded with people for money or another type of financial capital. Because of this, these forms of financial capital do not have a stable price. This means that some people try to make a profit by buying and selling these types of financial capital in a market.

Somethings are treated as financial capital, even though they do have a use. For example, some people buy and sell land but are not interested in doing anything with it. Some people think this sort of trade is bad because the land should be used and not just treated like money. Other types of capital, such as social capital and human capital are rarely treated like financial capital. This may be because they involve people.

Financial capital represents the ownership title over real capital. A contract regarding any combination of capital asset is called a financial instrument. Financial capital refers to the funds provided by lenders and investors to businesses to purchase real capital like equipment for producing goods/services. Real capital may include shovels for gravediggers, sewing machines for tailors or machinery for manufacturing firms. It can be increased by issuing new currency notes and but this will note increase real capital. Financial capital is provided by lenders on interest to the owners.

Importance of Capital

Capital is one of the most important factor of production. As a factor of production, it has the following parts of significance:

1. **Production of Goods and Services.** For the production of goods and services on large scale, capital goods are urgently needed because natural recourses

alone cannot produce goods unless they are exploited by using machinery and tools. Money is needed to acquire machines, tools, implements and raw materials to produce goods on large scale.

2. **Increase in Productivity.** The productivity of labour and land rises with the rise of capital goods for they enable labour to produce more with the aid of capital than without it. With the development science and technology, capital has become fruitful in production.
3. **Means of Subsistence.** Working capital (*i.e.*, cash) is required to feed workers engaged in production because there is time-lag between the use of the capital material and the scale of goods. During this interval money-capital is employed to pay wages for enabling the workers to purchase essential goods in order to sustain themselves for contributing in the productive process at different levels.
4. **Round-about a Method of Production.** Without capital equipment, labour will be used in various different ways to produce consumer goods. The round about method of production is a special feature of capitalist economy. In case capital is not available, consumer goods would have to be produced with primitive method. A fisherman can catch some fish with the help of simple hook, line and stick. If he wants to catch more, he will have first to sacrifice his time and resources in building a boat and a net so that he may catch large amount of fish in future. The greater the number of processes, the more found about will be the method. So, capitalistic yields large production of goods and services in a given period.
5. **Economic Development.** In an economy, the accumulation of capital determines the rate of development. Capital is necessary to increase the stock of economic overheads like electricity, water, roads etc. Capital also increases productivity in agriculture, industry etc. It also increases skills of human beings.
6. **Increase in Employment.** Opportunities capital creates employment in the long run. At the early stages there may be unemployment as machines would displace men, because of fall in both the average cost of production and price rise. As per requirement, more labour will be absorbed later. Labour productivity would also goes up when works like machines. Their income and purchasing power increases creating demand for goods and further employment. Additional employment is also created in capital goods industries to produce various types of capital goods.
7. **Compensating Land/labour Shortage.** In economics having scarce man-power or land can use capital in that place to some extent. These economies depend upon excessive capital intensive technique of production.
8. **Means of Transportation.** Railways, airways, roads and such systems of communication are built with the help of capital.
9. **Structure of Country's Defense.** Capital is necessary for manufacturing of war equipments and other defense materials. Thus, capital plays an important role in the economy.

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3.2.4 Entrepreneur

The word Entrepreneur, translated from its French roots, means "one who undertakes." The term is used to refer to anyone who undertakes the organization and management of an enterprise involving independence and risk as well as the opportunity for profit. In other words, the person who assumes the organization, management, and risks of a business enterprise is called entrepreneur.

In economics entrepreneur is a person who detects a previously untapped opportunity to make substantial profits (either by lowering the costs of producing existing good/services or by creating brand new ways for people to satisfy their wants through new products)—and then takes the initiative in bringing together the necessary factors of production to exploit this opportunity, typically by organizing a new business firm (or perhaps a new subdivision of an existing firm) for the purpose. The new opportunity which the entrepreneur has detected may involve the introduction of a new good or service only recently invented or improved. It might involve introducing some existing good or service into a new market area where it is presently unavailable or deepening the original market by finding and publicizing new ways for new groups of customers to use it. It might involve recognizing the potential of some new production technology for dramatically lowering the costs of production of an existing good or service, making it possible to garner huge sales increases at the expense of much higher cost substitutes that are thereby rendered obsolete and no longer competitive. Entrepreneurs thus serve an important role in enabling the economy to adapt to changing conditions and new possibilities for material improvements by creating new production organizations, and even whole new industries. Because of its essential role in initiating the process of production, entrepreneurship is identified by some economists as a "fourth factor of production," alongside land, labour and capital.

In the other words an entrepreneur is the factor of production that assumes the risk and faces the uncertainty of combining the other three resources and engaging in production. Without entrepreneur, the other resources remain idle and unproductive. Entrepreneur is a chief human factor of production.

Definitions

Some definitions of different economists related to Entrepreneur given as under:

Knight—*"An entrepreneur is a person who performs dual function of risk taking and control."*

Richard Cantillon—*"Entrepreneurship is defined as self-employment of any sort. Entrepreneurs buy at certain prices in the present and sell at uncertain prices in the future. The entrepreneur is a bearer of uncertainty."*

Jean Baptiste Say—*"The entrepreneur is the agent, who unites all means of production and who finds in the value of the products.—the reestablishment of the entire capital he employs, and the value of the wages, the interest, and rent which he pays, as well as profits belonging to himself."*

Frank Knight—*"Entrepreneurs attempt to predict and act upon change within markets. Knight emphasizes the entrepreneur's role in bearing the uncertainty of*

market dynamics. Entrepreneurs are required to perform such fundamental managerial functions as direction and control.

Whitehead—*"The entrepreneurs are the owners of the business who contribute the capital and bear the risk of uncertainties in business life. They may be sole traders, limited partners and shareholders.*

Vera Anstey—*"Entrepreneurs are the individual or firms including government who take decisions by promotion and organizing projects. They bring together various factors of production. They are willing to bear financial risk involved."*

Schumpeter—*"Entrepreneur is associated with innovations. Innovations mean the practical application of new ideas to reduce the cost of production or to improve the quality of products."*

Characteristics of Entrepreneur

The important characteristics of Entrepreneur as a factor of production are given below:

1. **Objective Approach.** Entrepreneurs take an objective approach to personal relationships and are more concerned with the performance and accomplishment of others than with feelings. They keep their distance psychologically and concentrate on the effectiveness of operations.
2. **Self-confidence.** Findings showed that as long as entrepreneurs were in control, they were relentless in pursuit of their goals. If they lost control, they quickly lost interest in the undertaking.
3. **Good Health.** The entrepreneurs must work long hours for extended periods of time. When they get sick, they recover quickly.
4. **A Need to Control and Direct.** Entrepreneurs prefer environments where they have maximum authority and responsibility and do not work well in traditionally structured organizations. This is not about power, though, entrepreneurs have a need to create and achieved by having control over events.
5. **Sense of Urgency.** Entrepreneurs have a never-ending sense of urgency to do something. This corresponds with a high energy level. Many enjoy individual sports rather than team sports. Inactivity makes them impatient.
6. **Comprehensive Awareness.** Entrepreneurs have a comprehensive awareness of a total situation and are aware of all the ramifications involved in a decision.
7. **Describing with Numbers.** Entrepreneurs can describe situations with numbers. They understand their financial position and can tell at any time how much they have in receivables and how much they owe.
8. **Realistic Outlook.** There is a constant need to know the status of things. They may or may not be idealistic, but they are honest and straightforward and expect others to be the same.
9. **Conceptual Ability.** Entrepreneurs have superior conceptual abilities. This helps entrepreneurs identify relationships in complex situations. Chaos does not bother them because they can conceptualize order. Problems are quickly identified and solutions offered. The drawback is that this may not translate well to interpersonal problems.

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10. **Low Need for Status.** Their need for status is met through achievement not through material possessions.
11. **Emotional Stability.** Entrepreneurs have the stability to handle stress from business and from personal areas in their lives. Setbacks are seen as challenges and do not discourage them.
12. **Attraction to Challenges.** Entrepreneurs are attracted to challenges but not to risks. It may look like they are taking high risks, but in actuality they have assessed the risks thoroughly.

Functions of Entrepreneur

The main functions of an entrepreneur are given as under:

- **Develop New Markets.** Under the modern concept of marketing, markets are people who are willing and able to satisfy their needs. In Economics, this is called effective demand. Entrepreneurs are resourceful and creative. They can create customers or buyers. This makes entrepreneurs different from ordinary businessmen who only perform traditional functions of management like planning, organization, and coordination.
- **Discover New Sources of Materials.** Entrepreneurs are never satisfied with traditional or existing sources of materials. Due to their innovative nature, they persist on discovering new sources of materials to improve their enterprises. In business, those who can develop new sources of materials enjoy a comparative advantage in terms of supply, cost and quality.
- **Mobilize Capital Resources.** Entrepreneurs are the organizers and coordinators of the major factors of production, such as land labour and capital. They properly mix these factors of production to create goods and service. Capital resources, from a layman's view, refer to money. However, in economics, capital resources represent machines, buildings, and other physical productive resources. Entrepreneurs have initiative and self-confidence in accumulating and mobilizing capital resources for new business or business expansion.
- **Introduce New Technologies.** New industries and new products. Aside from being innovators and reasonable risk-takers, entrepreneurs take advantage of business opportunities, and transform these into profits. So, they introduce something new or something different. Such entrepreneurial spirit has greatly contributed to the modernization of our economy. Every year, there are new technologies and new products. All of these are intended to satisfy human needs in more convenient and pleasant way.
- **Create Employment.** The biggest employer is the private business sector. Millions of jobs are provided by the factories, service industries, agricultural enterprises, and the numerous small-scale businesses. More jobs mean more incomes. This increases demand for goods and services. This stimulates production. Again, more production requires more employment.

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The Factors of Production
The factors of production are all around
all around
all around
The factors of production are all around
They make our goods
The first ingredient is the land
like cotton, iron
or some wood
The first ingredient is the land
They are the natural resources
Next we have the labour force
They are the ones
who do the work
Next we have the labour force
Workers one and all
Do you know about capital goods
big machines
and factories
Do you know about capital goods
You can't make a product without them
Don't forget the entrepreneurs
They are the ones
with the cash
Don't forget the entrepreneurs
They had the big idea
Put it all together and what do you have
what do you have
what do you have
Put it all together and what do you have
The factors of production

3.3 FACTORS AFFECTING PRODUCTION

The factors that affecting the quantity of production in explain in term of production function. The concept of the production function is one of the most important and elegant contributions of economics to human thought. Production function is a mathematical relation between the production of a good or service and the inputs used. A production

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function captures the general relation between total production and one or more inputs. The standard production function includes labour and capital as the inputs. However, a production function is general enough that any number of inputs can be included. Thus, the functional relationship between physical inputs and physical output is called production function.

Definitions

Some definitions of different economists related to production function given as under:

Prof. Watson—*"Production means the transformation of inputs into outputs. The production function is the name for the relationship between the physical inputs and the physical output of a firm."*

Prof. Leontief—*"A production function is a description of the quantitative relationship between the inputs absorbed and the outputs emerging from a particular production process."*

A production function is usually expressed in this general form:

$$Q = f(L, K, N, T, O, B, M, G, E)$$

(Here, Q—Quantity of production, *f*—Indicates a generic, as of yet unspecified, functional equation, L—Labour, K—Capital, N—Natural resources, T—Technology, O—Organization, B —Banking, M—Market, G—Government policies and E—Enterprise)

The factors that affecting the quantity of production are explained as below:

1. Labour. The quantity of production is affected by the efficiency of labour and the interest of labour. This is because if the labour is hardworking and disciplined then they produced in a large quantity.

2. Capital. The quantity of production is also depends upon the capital formation in a country. If it is more then the quantity of production is also more. For example, the farmers are growing more agricultural products if they are having a large number of capitals used in the farming.

3. Natural Resources. The quantity of production is also depends on the natural resources like minerals, rivers, climate etc. If the natural resources are available according to the condition, then they are helped in large quantity of production.

4. Technology. The quantity of production much depends on the technology and methods of production. The new technology helps in the production of goods and services in a large quantity.

5. Organization. The quantity of production depends on the organization. If the organization is more effective and skilled then the quantity of production is in the large amount.

6. Banking. The banking facilities are more effect the quantity of production. If the banks are provide more credit for the produces, and then they are able to produce in a large quantity. The banks can perform production effectively and successfully.

7. Market. This is also an important function which affects the quantity of production. If the demand of a market is for a commodity more the producer are produced in a larger quantity.

8. Government Policies. Polices of the government is also affect the production quantity. If the government help the producers by providing subsides, then the production of a

product and service is in a large quantity. Farmers are given better quantity seeds, fertilizers etc. at subsidized prices.

9. Enterprise. The quantity of production also depends upon the enterprise or the owner of the company. If they help the production department then quantity of production is increased.

3.4 METHODS OF PRODUCTION

The various methods of production are not associated with a particular volume of production. Similarly, several methods may be used at different stages of the overall production process. Some of them are given below:

1. Job Method. With Job production, the complete task is handled by a single worker or group of workers. Jobs can be small-scale/low technology as well as complex/high technology.

Low Technology Jobs. Here the organization of production is extremely simply, with the required skills and equipment easily obtainable. This method enables customer's specific requirements to be included, often as the job progresses. Examples include: hairdressers; tailoring.

High Technology Jobs. High technology jobs involve much greater complexity and therefore present greater management challenge. The important ingredient in high-technology job production is project management, or project control. The essential features of good project control for a job are:

- Clear definitions of objectives—How should the job progress (milestones, dates, stages)?
- Decision-making process—How are decisions taking about the needs of each process in the job, labour and other resources?

Examples of high technology/complex jobs are: film production; large construction projects (*e.g.*, the Millennium Dome).

2. Batch Method. As businesses grow and production volumes increase, it is not unusual to see the production process organized so that "Batch methods" can be used. Batch methods require that the work for any task is divided into parts or operations. Each operation is completed through the whole batch before the next operation is performed. By using the batch method, it is possible to achieve specialization of labour. Capital expenditure can also be kept lower although careful planning is required to ensure that production equipment is not idle. The main aims of the batch method are, therefore, to:

- Concentrate skills (specialization)
- Achieve high equipment utilization

This technique is probably the most commonly used method for organizing manufacture. A good example is the production of electronic instruments.

Batch methods are not without their problems. There is a high probability of poor work flow, particularly, if the batches are not of the optimal size or if there is a significant

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difference in productivity by each operation in the process. Batch methods often result in the build up of significant "work in progress" or stocks (*i.e.* completed batches waiting for their turn to be worked on in the next operation).

3. Flow Methods. Flow methods are similar to batch methods—except that the problem of rest/idle production/batch queuing is eliminated. Flow has been defined as a "method of production organization where the task is worked on continuously or where the processing of material is continuous and progressive,". The aims of flow methods are:

- Improved work and material flow
- Reduced need for labour skills
- Added value/completed work faster

Flow methods mean that as work on a task at a particular stage is complete, it must be passed directly to the next stage for processing without waiting for the remaining tasks in the "batch". When it arrives at the next stage, work must start immediately on the next process. In order for the flow to be smooth, the times that each task requires on each stage must be of equal length and there should be no movement off the flow production line. In theory, therefore, any fault or error at a particular stage.

In order that flow methods can work well, several requirements must be met:

1. There must be substantially constant demand. If demand is unpredictable or irregular, then the flow production line can lead to a substantial build up of stocks and possibility storage difficulties. Many businesses using flow methods get round this problem by "building for stock" *i.e.*, keeping the flow line working during quiet periods of demand so that output can be produced efficiently.

2. The product and/or production tasks must be standardized. Flow methods are inflexible—they cannot deal effectively with variations in the product (although some "variety" can be accomplished through applying different finishes, decorations etc at the end of the production line).

3. Materials used in production must be to specification and delivered on time. Since the flow production line is working continuously, it is not a good idea to use materials that vary in style, form or quality. Similarly, if the required materials are not available, then the whole production line will come to a close—with potentially serious cost consequences.

4. Each operation in the production flow must be carefully defined and recorded in detail

5. The output from each stage of the flow must conform to quality standards. Since the output from each stage moves forward continuously, there is no room for sub-standard output to be "re-worked" (compare this with job or batch production where it is possible to compensate for a lack of quality by doing some extra work on the job or the batch before it is completed).

The achievement of a successful production flow line requires considerable planning, particularly in ensuring that the correct production materials are delivered on time and that operations in the flow are of equal duration.

Common examples where flow methods are used are the manufacture of motor cars, chocolates and televisions.

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3.5 APPLICATION AND IMPORTANCE OF PRODUCTION

Production is a process by which the inputs are converted into output. It means that production play an important role in economic development of a country. All the developed countries are rich because of there large amount of production. Some areas are given below in which production play an important role:

1. Economic Development. Economic development is a sustainable increase in living standards that implies increased per capita income, better education and health as well as environmental protection. This is possible by increasing the production of products, services, machines, tools, electricity, chemicals etc. Due to increase in production, income of producers is increased and it is helping in economic development of a country.

2. Trade. Trade is the commercial exchange (buying and selling on domestic or international markets) of goods and services. It is possible only by the help of production. If one country produced in large quantity, then it has an option to export it to another country.

3. Government's Income. The income of a government comes from all sources, used to pay for a nation's expenses. A large amount of government income is comes from the production in the form of sale tax, excise duty, custom duty etc.

4. Consumption. Consumption is the use of resources, goods, or services to satisfy wants and needs. The production is playing an important role in the consumption. This is because without production no consumption is taken place.

5. Economic Planning. In India economic plan is made for five years. It is made with the help of production target of different industries. This economic plan achieved by achieving the production target.

3.5.1 Production Inputs

The resources or factors of production used in the production of output by a firm. This term is most frequently associated with the analysis of short-run production, and is often modified by the terms fixed and variable, as in fixed input and variable input. The quantity of a variable input can be changed in the short run and the quantity of a fixed input cannot be changed. The quantity of some inputs are used can be adjusted rapidly, but others are not as easy to adjust. Thus, the inputs or factors of production are divided into two categories:

- **Fixed Factor of Production or Input:** Fixed factor of production or input is defined as, an input that quantity does not change according to the quantity of output, at least over the short-run. For example, buildings, plants, big machines and equipments and management.
- **Variable Factor of Production or Input:** Variable factor of production or input is defined as an input that quantity may be changed in the short-run as change in the quantity of output. For example, quantity of raw material and quantity of labour.

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3.5.2 Production Time Periods

The time periods used to differentiate between variable inputs and fixed inputs that are key to the analysis of short-run production and long-run production by a firm. The two time periods are short run and long run.

• **Long-run or Long Period:** Long-run or long period is defined as that time period in which all the inputs or factors of production are changeable. The long period is refers to that time period in which the quantity of all factors of production are changed easily.

• **Short-run or Short Period:** Short-run or short period is defined as that time period in which one or more inputs or factors of production are varied others are fixed. The short period is refers to that time period in which the quantity of all factors of production are not changed easily.

3.6 PRODUCTION FUNCTION

The production function is the mathematical relation between the production of a good or service and the inputs used. A production function captures the general relation between total production and one or more inputs. The standard production function includes labour, capital and Land as the inputs. However, a production function is general enough that any number of inputs can be included. Alternatively, a production function can be defined as the specification of the minimum input requirements needed to produce designated quantities of output, given available technology. It is usually presumed that unique production functions can be constructed for every production technology.

The firm is assumed to be making Allocative choices concerning how much of each input factor to use, given the price of the factor and the technological determinants represented by the production function. A decision frame, in which one or more inputs are held constant, may be used; for example, capital may be assumed to be fixed or constant in the short run, and only labour variable, while in the long run, both capital and labour factors are variable, but the production function itself remains fixed, while in the very long run, the firm may face even a choice of technologies, represented by various, possible production functions. Production function relates physical inputs to physical outputs, and prices and costs are not considered.

A production function provides an abstract mathematical representation of the relation between the production of a good and the inputs used. A production function is usually expressed in this general form:

$$Q = f(L, K, R)$$

Here (Q—quantity of output, L—Labour, K—Capital, R—Land or Raw material)

L, K, R = factor inputs (such as labour, capital, land or raw materials). In the economics, there are two of input-output relations or production functions. *First*, the production function in which the quantities of some inputs are kept constant and quantity of one input or few inputs are varied. This type of production function or input-output relation is consider as returns to variable factor and law of diminishing returns which is also called *law of variable proportions*. *Second*, the production function or input-output relation in

which all inputs are varies. This type of production function is called *law of returns to scale.*

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3.6.1 Concepts of Products

Concerning the production of goods and services by factors, there are three concepts:

1. Total product
2. Marginal product
3. Average product

Total Product

Total product of a factor is the *amount of total output produced by a given amount of the factor given the amount of other factors or inputs*. Total product is the foundation upon which the analysis of short-run production for a firm is based. The usual framework is to analyze total product when a variable input (labour) changes, while a fixed input (capital) does not change. Two related concepts derived from total product are average product and marginal product.

Total product can increase to a particular level only. Hence increase in variable factors of production will not always increase the total product, and some times it may be decrease.

Marginal Product

Marginal product is defined as the *change in the quantity of total product resulting from a unit change in a variable input, keeping all other inputs unchanged*. Marginal product, usually abbreviated MP, is found by dividing the change in total product by the change in the variable input.

The formula for specifying and calculating marginal product from total product is given as:

Marginal Product = Change in total product / Change in variable input

Average Product

Average product is defined as the *quantity of total output produced per unit of a variable input, holding all other inputs fixed*. Average product, usually abbreviated AP, is found by dividing total product by the quantity of the variable input. In the other way average product is the per unit production of a firm. Conceptually, it is simply the arithmetic mean of total product calculated for each variable input over a whole range of variable input quantities.

The formula for specifying and calculating average product from total product is given as:

Average Product = Total product / Variable input

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3.7 LAWS OF PRODUCTION

In economics, law of production are describe with the help of production function or input-output relationship. Law of production are of two types, first law of variable proportion (quantity of one or few factor of input variable other constant) and second law of returns to scale (all factors of inputs are variable). Law of production are provides the techniques which help in increasing the quantity of output. Difference between these two laws are as follows:

Law of Variable Proportion or Returns to a factor	*Law of Returns to scale*
• One factor variable while others are constant.	• All factors are variable in same proportion.
• Generally short period analysis.	• Always long period analysis.

3.7.1 Law of Variable Proportion

This law describes the relationship between output and a variable input when other inputs are held constant. The law can be stated as follows:

"*If increasing amounts of one input are added to a production process while all other inputs are held constant, the amount of output added per unit of variable input will firstly and after some extent it start decreasing.*"

It states that if the quantity of one factor is increased with quantities of other factors held constant, the marginal increment to the total product may increase or remain constant at first but will eventually decrease after a certain point. The operation of this law can be, however, delayed by improvements in technology and or improvement in managerial ability. Ultimately this law must operate in the practical world. The level to which yields per acre, milk per cow or weight per poultry bird should be pushed is the kind of questions which involve the law of diminishing returns. It is, thus, an important point in farming to decide the level to which a farmer should push his output per acre or per cow, etc. to secure the maximum possible profit. This principle of returns is also important in specifying how large a farm should be or how much labour and/or machinery be added. In this context resources can be classified as variable resources and fixed resources.

Definitions

Some definitions of different economists related to Law of Variable Proportion given as under:

Marshall—"*An increase in the capital and labour applied in the cultivation of land causes in general a less than proportionate increase in the amount of product raised unless it happens to coincide with an improvement in the arts of agriculture.*"

G. Stigler—"*As equal increment of one input are added; the inputs of other productive services being held constant, beyond a certain point the resulting increments of product will decrease i.e., the marginal product will diminish.*"

Leftwich—"*The law of variable proportion states that if the input of one resource is increased by equal increments per unit of time while the inputs of other resources*

held constant, total output will increase, but beyond some points the resulting output increases will become smaller and smaller."

P.A. Samuelson—*"An increase in some inputs relative to other fixed inputs will, in a given state of technology, causes output to increase; but after a point the extra output resulting from the same addition of extra inputs will become less."*

Assumptions

The law of Returns to a factor or variable proportion holds good under the following conditions or assumptions:

1. **Constant Technology.** The law of variable proportion assumes the technology of production as constant. The reason is that if the state of technology change then marginal and average product may rise instead of diminishing.
2. **Homogeneous Factor.** This is based on the assumption that the variable resource is applied unit by unit and each factor unit is homogeneous or identical in amount and quality.
3. **Short-run.** The law specially operates in the short-run because here some factors are fixed and the proportion of others has to be varied. It assumes that one factor is variable while the others are fixed.
4. **Changeable Input Ration.** The law supposes the possibility of the ratio of fixed factors to variable factors being changed. In other words, it is possible to use various amounts of a variable factor with fixed factors of production.

Explanation

The law of variable proportion is explained with the help of an example as given below:

For example, supposing that a farmer have a farm of one acre and he also possess agricultural equipments, seeds etc. the farmer want to grow potatoes. He wants to decide about the quantity of fertilizers to grow potatoes. Keeping all other factors constant, as the quantity of fertilizers are increased on the land, their total, marginal and average products will changed as shown in the table 3.1 below:

Table 3.1 Performance of Total, Marginal and Average Products

Units of Land (1)	*Quantity of Fertilizers (F)* (2)	*Total Product (TP)* (3)	*Marginal Product (MP = ΔTP/ΔF)* (4)	*Average Product (AP = TP/F)* (5)
1	1	1	1	1
1	2	3	3 – 1 = 2	1.5
1	3	9	9 – 3 = 6	3
1	4	12	12 – 9 = 3	3
1	5	13	13 – 12 = 1	2.6
1	6	13	13 – 13 = 0	2.1
1	7	12	12 – 13 = –1	2

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As shown in the table, column 1 shows the fixed factor *i.e.*, land, column 2 shows the variable factor *i.e.*, quantity of fertilizers, column 3 shows the total product, column 4 shows the marginal product (change in total product as use of one extra unit of fertilizers), column 5 shows the average product (total product divided by the quantity of fertilizers).

The table 3.1, shows that as the units of fertilizers are increased to the fixed amount of land, firstly the total product rise at an increasing rate up to the 3 units of fertilizers. After that it rises at diminishing rate. When 5 units of fertilizers used, the total product is maximum. The marginal product first increases reaching maximum when 3 units of fertilizers are used. After that it starts decreasing but remains positive up to 5 units of fertilizers. The marginal product of sixth unit of fertilizer becomes zero and it become negative on the seventh unit of fertilizes. The average product first increase and then decrease as the farmer increase the units of fertilizers. The average product becomes equal to marginal product on the fourth unit of fertilizers and then it starts declining. It is always positive after each and every units of fertilizer. The marginal product decreases faster than the average product.

3.7.2 Three Stages of Law of Variable Proportion

The performance of output when the various quantity of variable factor is combined with the fixed quantity of the other factors of production can be divided into three stages. To understand these three stages it is batter to graphically illustrate the production function with one variable factor. This is shown in figure 3.1 below. In this figure 3.1, on X-axis we take the quantity of the variable factor and on the Y-axis we take the quantity of output. The total product, marginal product and average product of the variable factor are changed as a result of change in its quantity. The change in the total product, marginal product and average product due to increase in the variable factor are explain below in three stages. (Total product curve TP, marginal product curve MP and average product curve AP)

Stage 1. Increasing returns to a factor: (O – E) Boundary line EB

In this stage the total product is increase with increasing rate upto a point. As shown in figure, from origin to point A, slope of the total product curve (TP) is increase, which is upto point A, the total product increases at the increasing rate. After the point A total product increase with diminishing rate upto point B and this point A is called point of inflection.

In this stage marginal product firstly increase and reach to the maximum point at G, just below the point A of total product curve. Corresponding vertically to this point of inflection marginal product is maximum; after this point its slope goes to downward, means it start decreasing. During this stage marginal product curve (MP) rise in a part and then fall. In this stage average product rise and reach its maximum at point D. on the point D average product and marginal product are equal (AP = MP).

This stage is known as the stage of increasing returns because average product of the variable factor increase through out this stage. It is notable that the marginal product in this stage increases and in a later part it starts declining. But remain greater than the average product so that the average product continue to rise. The total product also increases.

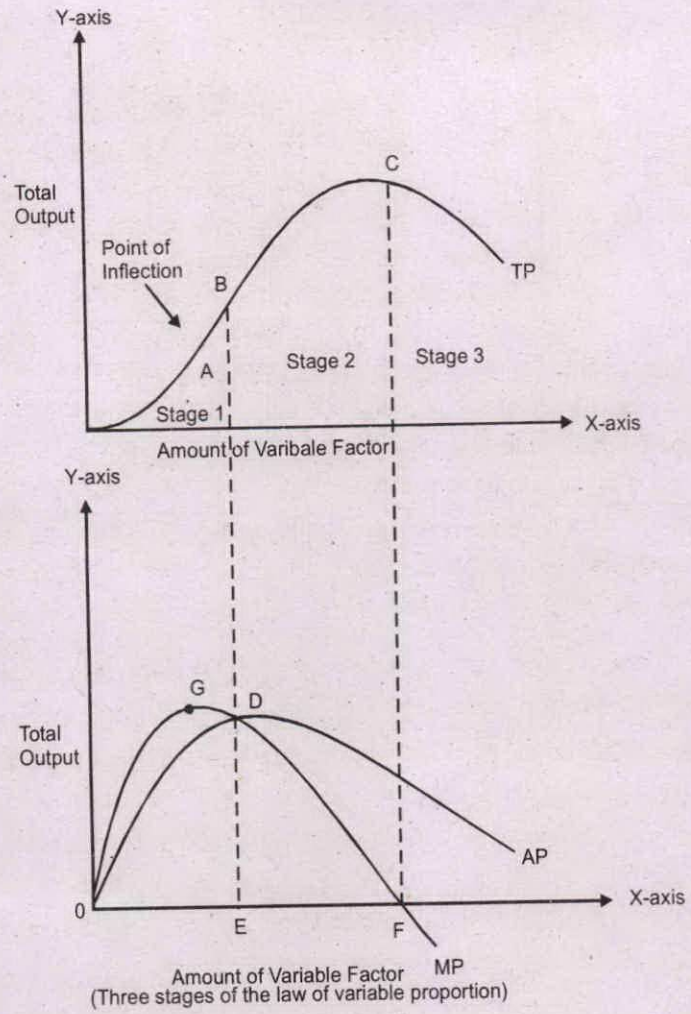

Figure 3.1

Stage 2. Diminishing returns to a factor: (E–F) Boundary FC

In this stage total product continues to increasing at the diminishing rate and reaches its maximum point at C. The marginal product of the variable factor is decreasing but remains positive. At the end of this stage the marginal product become zero at point F. In this stage the average product of the variable factor are also decreasing but remain positive.

This stage is called as the stage of diminishing returns to a factor because both the average and marginal product of the variable factor continues to fall during this stage.

Stage 3. Negative returns to a factor: Beyond F

In this stage the total product starts decreasing and therefore the total product curve (TP) slope goes downwards. The marginal product in this stage becomes negative, so the marginal product curve (MP) goes below to the X-axis. The average product continues to decreasing but always remains grater than zero.

This stage is called stage of negative returns to a factor because the marginal product of the variable factor becomes negative during this stage.

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Table 3.2

Stage	*Total Product*	*Marginal Product*	*Average Product*
Stage 1 Increasing returns to a factor (O–E) Boundary line EB	Firstly it increases with increasing rate upto point A. After this point increases with diminishing rate.	Firstly increase and reach the maximum point at G. After this point it starts decreasing.	Increases and reach to maximum at point D, on the boundary of stage 1.
Stage 2 Diminishing returns to a factor (E–F) Boundary line FC	Continues to increasing with diminishing rate and become maximum at point C.	Continues to decreasing and become zero at point F.	Start decreasing
Stage 3 Negative returns to a factor beyond F	After reaching its maximum, it starts decreasing.	Become negative	Continues to decreasing but always remain greater than zero.

3.7.3 Relationship between TP, MP and AP

The total product, marginal product and average product are the three aspects of measuring product. They have following inter-relationship:

1. Initially AP and MP both increases and then become equal.
2. The rate of decreasing as well as increasing in MP is faster than AP.
3. When MP is zero, AP is not zero but TP is the maximum.
4. MP can be negative but not AP and TP.

3.7.4 Results of Law of Variable Proportion

In stage 1, the increasing returns to a variable input but fixed factor is not used economically.

In stage 2, the diminishing returns to a variable input, the quantity of total product is maximum and economically utilization of fixed factor.

In stage 3, the negative returns to a variable input, the quantity of total product is decrease and uneconomically utilization of both fixed and variable factor.

So the most of the firms and farmers are used the combination of the stage 2.

3.8 RETURNS TO SCALE

Returns to scale indicate to increase in the output when all resources or factors are proportionately increased in the long run. Returns to scale come in three forms—increasing, decreasing, or constant based on whether the changes in production are proportionally more than, less than, or equal to the proportional changes in inputs. Returns to scale are the guiding principle for long-run production, playing a similar role that the law of diminishing marginal returns plays for short-run production.

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Definitions

Some definitions of different economists related to Law of Returns to Scale given as under:

Marshall—*"An increase in the capital and labour applied in the cultivation of land causes, in general, a less than proportionate increase in the amount produce raised, unless it happens to coincide with an improvement in the art of agriculture."*

Liebhafsky—*"Returns to scale refers to the behaviour of total output as all inputs are varied in the same proportion and it is a long-run concept."*

Koutsoyannis—*"The term returns to scale refers to the change in the output as all factors change in the same proportion."*

Explanation

The law returns to scale explained with the help of an example, suppose in the long-run labour and capital are two variable factor of production. Both the factors are increased in the same proportion. The law returns to scale actually refers to changes in production subsequent a proportional change in all factors of production (where all factors increase by a constant).

The production function of these two factors of production is given below:

$$Q = f(L, K)$$

(Here Q—Quantity of production, L—Labour, K—Capital)

If increase in both factor of production by same proportion (n), then the factor of production function becomes:

$$Q = f\{n(L, K)\}$$

$$Q_1 = f(nL, nK)$$

Now the following cases are takes place:

1. **Constant returns to scale.** If Q_1 increase in the same proportion as increase in the factor of production, which is $Q_1/Q = n$.
2. **Increasing returns to scale.** if Q_1 increase more than proportionate increase in the factors of production, which is $Q_1/Q > n$.
3. **Diminishing returns to scale.** if Q_1 increase less than proportionate increase in the factors of production, which is $Q_1/Q < n$.

Explanation with the help of table

As given in the table 3.3; column (1) for units of labour, column (2) for units of capital, column (3) for percentage change in the labour and capital, column (4) for total product, column (5) for percentage change in the total product, column (6) for marginal returns, and column (7) for reruns to scale.

Percentage change in labour, capital and total product is calculated with help of following formula:

$$\text{Percentage change} = \frac{\text{Change in quantity}}{\text{Initial quantity}} \times 100$$

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For example

Initial quantity of capital = 3 and final quantity = 6, change in quantity = 6 – 3 = 3

Apply in the formula

Percentage change in capital = $\frac{6-3}{3} \times 100 = 100\%$

Table 3.3 Returns to Scale

Labour (1)	*Capital* (2)	*Percentage Change in Labour and Capital* (3)	*Total Product* (4)	*Percentage Change in Total Product* (5)	*Marginal Returns* (6)	*Returns to Scale* (7)
1	3	—	5	—	—	
2	6	100 %	15	200 %	10	Increasing
3	9	50 %	30	100 %	15	
4	12	33 %	40	33 %	10	Constant
5	15	25 %	50	25 %	10	
6	18	20 %	55	10 %	5	Decreasing
7	21	14 %	58	5 %	3	

3.8.1 Classification of Returns to Scale

Returns to scale is of three types as given below:

1. Increasing returns to scale
2. Constant returns to scale
3. Decreasing returns to scale

Increasing Returns to Scale

Increasing returns to scale take place when a given percentage change in all resources in the long run results in a proportionately greater change in production. Increasing returns to scale exists if a firm increases all resources—labour, capital, and other inputs—by a given percentage and output increase by more than this percentage.

As shown in the figure 3.2, if 5% increase in all the factors of input (labour, capital) causes 10% increase in the output; this is the case of increasing returns to scale.

Economists usually explain "increasing returns to scale" by indivisibility. That is, some methods of production can only work on a large scale—either because they require large-scale machinery, or because (getting back to Adam Smith, here) they require a great deal of division of labour. Since these large-scale methods cannot be divided up to produce small amounts of output, it is necessary to use less productive methods to produce the smaller amounts. Thus, costs increase less than in proportion to output—and average costs decline as output increases.

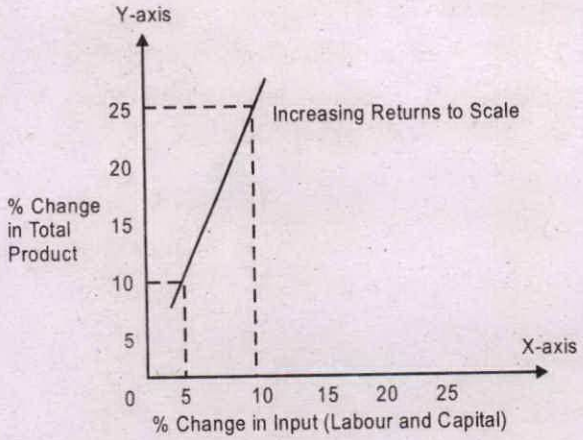

Figure 3.2

Constant Returns to Scale

Constant returns to scale take place when a given proportional change in all resources in the long run results in the same proportional change in production. Constant returns to scale exists if a firm increases all resources—labour, capital, and other inputs— by a given percentage and output increases by same percentage.

As shown in the figure 3.3; if 10 % increase in all the factors of input (labour, capital) causes 10 % increase in the output, this is the case of constant returns to scale.

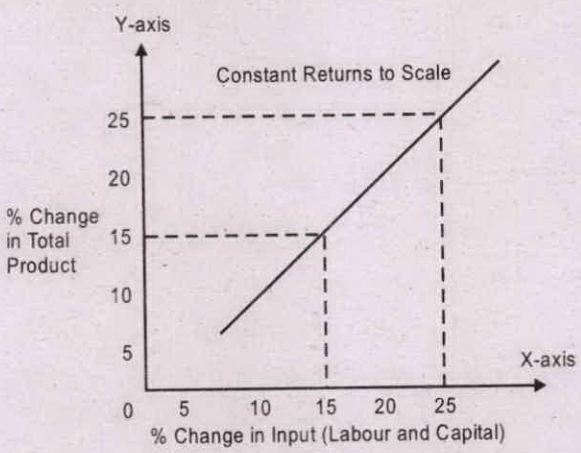

Figure 3.3

In the constant returns to scale, where the typical firm (or industry) consists of a large number of units doing pretty much the same thing, so that output can be expanded or contracted by increasing or decreasing the number of units. In the days before computer controls, machinery was a good example. Essentially, one machinist used one machine tool to do a series of operations to produce one item of a specific kind—and to double the output you had to double the number of machinists and machine tools.

Decreasing Returns to Scale

Decreasing returns to scale take place when a given proportional change in all resources in the long run results in a proportional smaller change in production. Decreasing returns

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to scale exists if a firm increases all resources—labour, capital, and other inputs—by a given proportion and output increases by less than this proportion.

As shown in the figure 3.4; if 10 % increase in all the factors of input (labour, capital) causes 5 % increase in the output, this is the case of decreasing returns to scale.

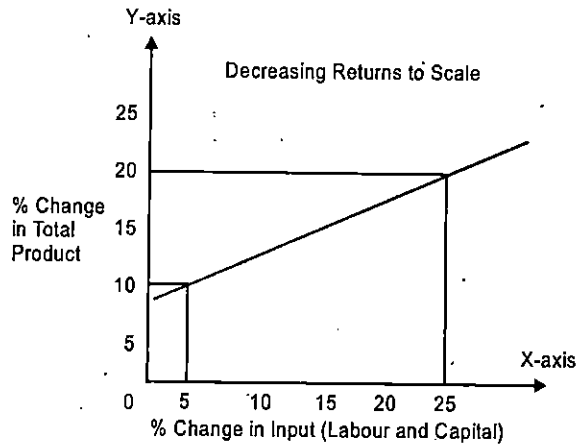

Figure 3.4

Decreasing returns to scale are associated with problems of management of large, multi-unit firms. Again with think of a firm in which production takes place by a large number of units doing pretty much the same thing — but the different units need to be coordinated by a central management. The management faces a trade-off. If they don't spend much on management, the coordination will be poor, leading to waste of resources, and higher cost. If they do spend a lot on management, that will raise costs in itself. The idea is that the bigger the output is, the more units there are, and the worse this trade-off becomes—so the costs rise either way.

Point of Difference	*Law of Variable Proportion*	*Returns to Scale*
Definition	The law of variable proportion states that if the input of one resource is increased and inputs of other resources held constant, total output will increase, but beyond some points the resulting output increases will become smaller and smaller.	Returns to scale indicate to increase in the output when all resources or factors are proportionately increased in the long run.
Time period	Law of variable proportion apply in the short-run only	Returns to scale is apply in the long-run only
Production and scale of production	Level of production changed and scale of production remains constant.	Both the level of production and scale of production are changed
Factors change	Only one factor of input is changed, others are remains constant	All the factors of input are changed in the same ratio

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3.9 ECONOMIES OF SCALE

Economies of scale in production mean that production at a larger scale (more output) can be achieved at a lower cost (*i.e.*, with economies or savings). A simple way to celebrate this is to assume that the unit-labour requirement in production of a good is a function of the level of output produced.

Economies of scale are the result of: (1) increased resource specialization, (2) decreased resource prices, (3) increased by-product use, (4) increased auxiliary activities, and (5) the geometric relation between volume and area.

"**Adam Smith** also identified *the division of labour and specialization as the two key means to achieve a larger return on production. Through these two techniques, employees would not only be able to concentrate on a specific task, but with time, improve the skills necessary to perform their jobs. The tasks could then be performed better and faster.*"

For example, if firm's average cost per unit is ₹ 10 at the output of 100 units and when it expands its output to 200 units, the average cost per unit reduced to ₹ 8, then the firm enjoys economies of scale. So they occur, when a percentage increases equally in all inputs leads to a greater percentage change in output. Inputs are land, labour and capital and output are the goods and services the firm produces. Economies of scale occur only in long run and can be divided into two groups:

- Internal Economies of Scale
- External Economies of Scale.

3.9.1 Internal Economies of Scale

Internal economies of scale means when a firm increase its scale of production and reduced costs or cost advantages that occur when a firm expend itself, that is, when it increases its own size by installing bigger plants. Therefore these economics of scale are also called economies of large-scale production.

Definition

Definition of different economist related to Internal Economies of Scale given as under:

Cairncross—*"Internal economies are those which are open to a single firm or a single factory independently of the action of other firms. They results from an increase in the scale of output of a firm and cannot be achieved unless output increases."*

Internal economies means increasing returns to scale. Theses are results of division of labour and the use of improved methods of production. The benefits of these economies are received by a firm according to its organization efficiency. The internal economies are divided into two categories: Real economies and financial economies.

Real Economies

Real economies are those economies which are related to the various type of machineries, physical quantity of input, different type of labours and raw materials. The main types of real economics are given below:

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Technical Economies

Technical economies also influence the returns to scale. The bigger firms are able to buy equipment that wouldnot be economical for small firms to purchase; these equipments are related to the fixed capital that is different type of machines and plants. Technical economies may use mass production techniques, which are a more efficient form of production. A larger firm can also afford to invest more in research and development. Technical economies may arise out of the any one of the following reasons:

1. **Expensive capital inputs.** Large-scale businesses can afford to invest in expensive and specialist machinery. For example, a supermarket might invest in new database technology that improves stock control and reduces transportation and distribution costs. It may not be cost-efficient for a small corner shop to buy this technology. We find that highly expensive fixed units of capital are common in nearly every mass manufacturing production process—a good example is investment in robotic technology in producing motor vehicles or in assembling audio-visual equipment.
2. **Specialization of the workforce.** Within larger firms the production process can be split into separate tasks to boost productivity.
3. **Learning by doing.** There is growing evidence that industries learn-by-doing. The average costs of production decline in real terms as a result of production experience as businesses cut waste and find the most productive means of producing output on a bigger scale.

Marketing Economies

A large firm can spread its advertising and marketing budget over a much greater output and it can also purchase its factor inputs in bulk at discounted prices if it has buying power in the market. A good example would be the ability of the electricity generators to negotiate lower prices when finalizing coal and gas supply contracts. The national food retailers also have significant buying power when purchasing supplies from farmers and wine growers and in completing supply contracts from food processing businesses.

Managerial Economies

This is a form of division of labour. For example, large-scale manufacturers employ specialists to supervise production systems And better management; increased investment in human resources and the use of specialist equipment, such as networked computers can improve communication, raise productivity and thereby reduce unit costs.

Network Economies

This type of economy is linked more to the growth of demand for a product. There is growing interest in the concept of a network economy of scale. Some networks and services have huge potential for economies of scale. That is, as they are more widely used (adopted), they become more valuable to the business that provides them. We can identify networks economies in areas such as online auctions and air transport networks. The marginal cost of adding one more user to the network is close to zero, but the

resulting financial benefits may be huge because each new user to the network can then interact, trade with all of the existing members or parts of the network. The rapid expansion of e-commerce is a great example of the exploitation of network economies of scale. E-bay is a classic example of exploiting network economies of scale as part of its operations.

Integration of processes economies. Integration of production process of a commodity is another factor that gives rise to some economies of large scale of production. For example, a cold-drinks manufacturing company also setup its own bottle manufacturing machines and another example a steel firm may start doing various processes such as melting of iron, making of steel and converting steel into different shapes and sizes. This integration process increases the productivity and efficiency of a firm and proves to be highly economical.

Labour Economies

The productivity of a firm is also increase by taking the advantages of the labour economies. A big firm employs a large number of workers. Each worker gets the work he is fit for. The works are get skills and performed such operations which saves the time and encourages new ideas. The personnel manager evaluates the work efficiency if needed. This leads to increase production and decrease cost.

Bulk-buying economies. In the bulk buying economies as businesses grow there is need to order larger quantities of production inputs. For example, order of more raw materials. As the order value increases, a business obtains more bargaining power with suppliers. It may be able to obtain discounts and lower prices for the raw materials.

Financial Economies

In financial economies of scale larger firms are usually rated by the financial markets to be more 'credit worthy' and have access to credit facilities with favourable rates of borrowing. In contrast, smaller firms often face higher rates of interest on overdrafts and loans. Businesses quoted on the stock market can normally raise fresh money (extra financial capital) more cheaply through the sale (issue) of equities to the capital market. They are also likely to pay a lower rate of interest on new company bonds because of a better credit rating.

	Types of internal Economies of scale
Financial	The farm has been able to gain loans and assistance at preferential interest rates from the EIB, World Bank and the EU
Marketing	It has managed to dedicate resources to its strategy of niche marketing
Technical	The access to finance has allowed it to invest in sophisticated Israeli irrigation technology
Managerial	It large size enables it to employ specialized personnel such as estate managers.
Risk bearing	The farm has used some of its land to diversify into producing fresh vegetables for export as well as continue producing maize.

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3.9.2 External Economies

External economies of scale occur outside of a firm but within an industry. External economies are those economies which grow to the firms as a result of the expansion in the output of the whole industry and they are not depends on the output level of individual firms. Thus, when an industry's scope of operations expand due to for example the creation of a better transportation network, resulting in a decrease in cost for a company working within that industry, external economies of scale have been achieved.

Definition

Definition of different economist related to External Economies of Scale given as under:

Cairncross—*"External economies are those which are shared in by a number of firms or industries when the scale of production in any industry or group of industries increases. They are not monopolized by a single firm when it grows in size, but are conferred on it when some other firms grow larger."*

External economies of scale occur when a firm benefits from lower unit costs as a result of the whole industry growing in size. The main types of external economies of scale are:

1. Economies of Transport and Communication. As an industry establishes itself and grows in a particular region, it is likely that the government will provide better transport and communication links to improve accessibility to the region. This will lower transport costs for firms in the area as journey times are reduced and also attract more potential customers. For example, an area of Scotland known as Silicon Glen has attracted many high-tech firms and as a result improved air and road links have been built in the region.

2. Economies of Training and Education. Universities and colleges will offer more courses suitable for a career in the industry which has become dominant in a region or nationally. For example, there are many more IT courses at being offered at colleges as the whole IT industry in the UK has developed recently. This means firms can benefit from having a larger pool of appropriately skilled workers to recruit from.

3. Economies of Commercial Services. As an industry grows other businesses start up in support of them increasing competition and their own economies of scale mean they can sell components and services at lower unit cost to the industry.

3.9.3 Comparison between Internal and External Economies

Alfred Marshall made a distinction between internal and external economies of scale. When a company reduces costs and increases production, internal economies of scale have been achieved. External economies of scale occur outside of a firm, within an industry. Thus, when an industry's scope of operations expands due to, for example, the creation of a better transportation network, resulting in a subsequent decrease in cost for a company working within that industry, external economies of scale are said to have been achieved. With external economies of scale, all firms within the industry will benefit. Some differences are given below:

1. Internal economies are beneficial to a particular firm and external economies are beneficial to all firms in an industry.
2. Due to fall in the cost of production only one firm earn profit in internal economies and in external economies all firm in an industry get the benefit.
3. External economies are more important than internal economies in the developing countries this is because when government of these countries invests in power, technology, transport etc. all the firms gain benefit.

3.10 DISECONOMIES OF SCALE

Economies of scale provide benefit to a firm or company to a certain limit, after reaching this limit economies are converted in to diseconomies. Diseconomies of scale occur when Average Costs start to rise with increased output. Therefore, there will be decreasing returns to scale.

In other way, diseconomies of scale is same as diminishing returns to scale means a given percentage increase in the all the factors of production causes less percentage increase in the output. The diseconomies of Scale also two types—Internal Diseconomies of scale and External Diseconomies of Scale.

3.10.1 Internal Diseconomies of scale

As the size of the firm become too large, that cause increases in the unit cost of production. These increases in the unit cost of production that happen due to expansion of a firm beyond a certain point are called internal diseconomies of scale. It becomes a tough problem to supervise the work spread all over. It affects the efficiency of the firm. Interr ' ' :conomies occur as the output of the firm is rising. Causes of internal diseconom.cs ?.. given below:

1. Interdependency. In large firms with many different departments, each part of the company becomes interdependent. A machine failure in the packaging department may result in stopping the whole production line for example.

2. Coordination and Communication. Large firms have long chains of command. Information from the top management may not be communicated to the production line properly and vice-versa.

3. Industrial Relations. Because of the lack of contact between senior management and the work force, the workers may feel insignificant or uncared for. Industrial disputes may arise and production may suffer.

3.10.2 External Diseconomies of Scale

External diseconomies are defined as the diseconomies which are know by all the firms of an industry when the scale of the production of the industry as a whole expands away from manageable limits. As output increases in an industry, each of the factors of

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production, land, labour, capital and enterprise, become scarcer. As they become scarcer their prices increase. Some other causes of external diseconomies are given below:

1. **Increased Resource Prices.** As the scale of production increases from small to large, some resource prices are likely to decline as suppliers provide volume discounts and take advantage of their own decreasing average cost. However, with additional expansion of the scale, resource prices might very well increase. Higher resource prices raise average cost.
2. Local labour becomes scarce and firms have to offer higher wages
3. Land and factories become scarce and rents begin to rise
4. Local roads become congested and transport costs begin to rise.

The main cause of diseconomies of scale is communication failure—when a company becomes too large, there are many layers of management between the shop floor and the board of directors. This leads to resources not being allocated as effectively as they could be, and often has a retardant effect on the decision-making process, because so many individuals are involved in it. It's a common criticism of large companies that the managers and directors are not "in touch" with the real situation of the company.

Diseconomies of scale occur later in large companies that are simply mass-producing a standardized product than in smaller ones that need to meet each customer's requirements exactly because they are more capable of running from habit and inertia, so the retarded decision-making process does not affect them as much.

3.11 SUMMARY

- In the common way the term production means the creation of a physical product. Production is simply the conversion of *inputs* into *outputs*. It is an economic process that uses resources to create a commodity that is suitable for exchange.
- Production and consumption are two related terms. First of a commodity is produced and then it consumed. Production is the process of transforming the natural resources of the land into consumer satisfying consumption goods or productive capital goods.
- Resources required for generation of goods or services, generally classified into four major groups: (1) Land, (2) Labour, (3) Capital, and (4) Enterprise
- Land was sometimes defined in classical and neoclassical economics as the "*original and indestructible powers of the soil.*
- *"Land applies to all those gifts of nature which man uses in providing the things that satisfy his wants."*
- The collective or generic name given to all the various productive services provided by human beings, including physical effort, skills, intellectual abilities and applied knowledge.

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- The labour is divided into the different categories on the bases of the work, qualification, training etc.
- In economics capital is used in various senses. In the ordinary language capital is used in the sense of money. But when we talk of capital as a factor of production, it is quit wrong. We know money is used to purchase various factors such as raw materials, labour, machinery which help in the production of goods and services.
- Capital is classified or divided into two categories *i.e.*, Real capital and financial or money capital.
- Real capital defined as equipment and machinery, which is used to produce goods and services.
- Financial capital, or economic capital, is any liquid medium or mechanism that represents wealth. It is not directly participate in the production process. Financial capital is the things that have value, but do not do anything by themselves.
- The word Entrepreneur, translated from its French roots, means "one who undertakes." The term is used to refer to anyone who undertakes the organization and management of an enterprise involving independence and risk as well as the opportunity for profit.
- The standard production function includes labour and capital as the inputs.
- The production function is the mathematical relation between the production of a good or service and the inputs used. A production function captures the general relation between total production and one or more inputs.
- A production function is usually expressed in this general form:

$$Q = f(L, K, R)$$

- In economics, law of production are describe with the help of production function or input-output relationship. Law of production are of two types, first law of variable proportion (quantity of one or few factor of input variable other constant) and second law of returns to scale
- Returns to scale indicate to increase in the output when all resources or factors are proportionately increased in the long run.
- Increasing returns to scale take place when a given percentage change in all resources in the long run results in a proportionately greater change in production.
- Economies of scale in production mean that production at a larger scale (more output) can be achieved at a lower cost (*i.e.*, with economies or savings). A simple way to celebrate this is to assume that the unit-labour requirement in production of a good is a function of the level of output produced.
- Economies of scale occur only in long run and can be divided into two groups:
  - Internal Economies of Scale
  - External Economies of Scale.

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- In financial economies of scale larger firms are usually rated by the financial markets to be more 'credit worthy' and have access to credit facilities with favourable rates of borrowing.
- External economies of scale occur outside of a firm but within an industry. External economies are those economies which grow to the firms as a result of the expansion in the output of the whole industry and they are not depends on the output level of individual firms.
- Economies of scale provide benefit to a firm or company to a certain limit, after reaching this limit economies are converted in to diseconomies. Diseconomies of scale occur when Average Costs start to rise with increased output. Therefore, there will be decreasing returns to scale.

3.12 REVIEW QUESTIONS

1. What do you understand by production? Is production possible without natural resources?
2. Define production and explain production functions.
3. Describe about the factors that affect production.
4. Illustrate all methods of production.
5. Describe production and explain the importance and application of production.
6. Explain various factors of production.
7. Define land and explain the importance of land as a factor of production.
8. What do you understand by the term land? Explain the characteristics of land.
9. Define labour and explain various characteristics of labour.
10. What is labour? Explain the importance of labour as a factor of production.
11. Define capital. Explain its various characteristics.
12. What is capital? Explain the importance of capital as a factor of production.
13. Define entrepreneurship and explain its importance as a factor of production.
14. What do you understand by entrepreneur? Explain its various functions.
15. What is division of labour? Explain types and advantages of division of labour.
16. What is division of labour? Explain its advantages and disadvantages.
17. What do you understand by law of variable proportion? Explain in detail.
18. Explain law of returns to scale and describe its various phases.
19. Explain law of variable proportion and returns to scale in brief.
20. Describe the three phases of returns to scale.
21. Explain the law of constant returns. Why does it apply?
22. Explain the concept of returns to scale with the help of phases of returns to scale.

23. Differentiate economies and diseconomies of scale?
24. What do you understand by economies and diseconomies of scale? Explain internal and external economies of scale.
25. Explain law of variable proportion and describe economies of scale.
26. Differentiate between external economies and internal economies.
27. Explain economies of scale and distinguish between returns to a factor and return to scale.
28. Explain the concept of economies and diseconomies of scale. What is the difference between returns to scale and returns to a factor?
29. Are diminishing returns to a factor inevitable? Distinguish between external and internal economies and discuss the relation of these economies with the law of increasing returns.

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UNIT 4: DEMAND AND LAW OF DEMAND

NOTES

STRUCTURE

4.1 DEMAND

In general use, "Demand" is a word that can have more than one meaning, but in economics we define it more carefully so that it has only one meaning. In the normal way the meaning of demand, desire, want and need are same. But in the economics all these terms have different meaning. Desire is a wish for a thing. For example, if you have desire for a laptop but you do not have enough money to spend on your desire. Then your desire will remain to be a wish for laptop. It is not a demand. In other condition if you have money but you are not willing to spend it on your desire (laptop). Then your desire becomes want and not demands. Your desire will become demand when you spend this money on laptop.

In economic word the demand is made to show the relationship between the prices of a commodity and the amounts of the commodity which customer wants to purchase at these prices. According to **Prof. Hibdon**, *"Demand means the various quantities of goods that would be purchased per time period at different prices in a given market."*

Definitions

Some definitions of different economists related to Demand given as under:

Prof. Mill—*"The demand of a commodity is the quantity of it that a consumer is ready to purchase at a given price."*

B.R. Schiller—*"Demand is the ability and willingness to buy specific quantity of good at alternative prices in a given time period, other thins being equal."*

Prof. Benham—*"The demand of a commodity at a given price is the quantity of it which bought at a particular time at that price."*

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Ferguson—*"Demand refers to the quantity of a commodity that the consumers are able and willing to buy at each possible price during a give period of time, other things being equal."*

From the above given definitions of demand we find out five aspects of demand are worthy of further consideration:

1. Desire or Need for a Thing. The demand for a product or service is created when first people have desire for a thing. Desire means need for a thing, everyone purchase a thing to satisfy his needs.

2. Money to Satisfy the Desire. The desires are satisfied with only with the help of money. It means that the demand is completed when you have money to satisfy the desire.

3. Willingness and Ability. Demand requires both willingness and ability. To demand a good, a buyer must have a willingness to buy it. Willingness generally arises because the good satisfies a want or need. But while wants and needs in total are essentially unlimited, everyone does not necessarily want or need every good. Demand, however, also requires ability. While demand can be constrained by the physical ability to purchase a good, income is often more important. Wants and needs may be unlimited, but income is not. A buyer must have enough income to make a purchase.

4. Range of Prices and Quantities. Demand is a range of prices and quantities. It includes not just the quantity purchased at the current price, but any and all quantities that would be purchased at other prices—higher and lower.

5. Given Time Period. Demand is identified for a specified time period. The analysis of asparagus demand needs information on the time period. Is the demand for an hour, a day, a week, a month, a year, or a decade? Presumably, people buy a larger quantity of asparagus, at a given price, over a decade than over a week. When economists work with demand they identify a specific time period.

Demand is the relationship between price and quantity demanded for a particular good and service in particular circumstances. For each price the demand relationship tells the quantity the buyers want to buy at that corresponding price. The quantity the buyers want to buy at a particular price is called the Quantity Demanded.

4.2 LAW OF DEMAND

The law of demand states that, if all other factors remain equal, the higher the price of a good, the less people will demand that good. In other words, the higher the price, the lower the quantity demanded.

The inverse relationship between demand price and the quantity demanded, assuming ceteris paribus factors are held constant. This fundamental economic principle indicates that a decrease the price of a commodity results in an increase in the quantity of the commodity that buyers are willing and able to purchase in a given period of time, if other factors are held constant. The law of demand is one of the most important principles found in the study of economics.

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Definitions

Some definitions of different economists related to Law of Demand given as under:

Marshall—*"The law of demand states that amount demanded increase with a fall in price and diminishes when price increase, other things being equal."*

Samuelson—*"Law of demand states that people will buy more at lower prices and buy less at higher prices, other things being equal."*

Bilas—*"The law of demand states that, other things being equal, the quantity demanded per unit of time will be greater the lower the price and smaller the price."*

Ferguson—*"According to the law of demand, the quantity demanded varies inversely with the price."*

The specific demand relation between price and quantity is termed the law of demand. The law of demand is the inverse relation between demand price and quantity demanded. If, in other words, the demand price increases, then the quantity demanded decreases. The law of demand is one of the most important and most fundamental economic principles identified in the study of markets and economics.

4.2.1 Assumption of Law

While starting the law of demand, "other things remaining constant" is used. It conceals the conditions on which the law of demand is based. The following are the assumptions of the law of demand:

1. There should be no change in the income of consumers.
2. There should be no change in the price of related goods.
3. There should be no change in the taste and preference of customers.
4. The customer does not expect change in price of commodity in near feature.
5. There should be no change in the wealth of customers.

4.2.2 Explanation of the Law

The law of demand is the inverse relationship between demand price and the quantity demanded, ceteris paribus. This fundamental economic principle indicates that as the price of a commodity decrease, then the quantity of the commodity that buyers are able and willing to purchase in a given period of time, if other factors are held constant, increases. The amount demanded is depends on a large number of factors, the most important factor is the nature of commodity. The law of demand is explaining with the use of demand schedule and the demand curve.

4.2.3 Demand Schedule

The demand schedule is defined as the table that shows the prices per unit of the commodity and the amount demanded per period of time. In different words the table that shows different prices of a good and the quantity of that good demanded at each of these prices. It is also defined as the quantities of a commodity that buyers are buy at different possible prices at a given period of time.

Definitions

Some definitions of different economists related to Demand Schedule given as under:

Prof. Benham—*"If the quantity sold of a commodity a given prices at a particular market is presented in a table, it is called demand schedule."*

McConnell—*"Demand schedule is a table that shows different prices of a good and the quantity of that good demanded at each of these prices."*

Demand schedule has two aspects— (1) Individual demand schedule and (2) market demand schedule.

1. Individual Demand Schedule. Individual demand schedule is defined as the table that shows the different quantities demanded at the different prices of a commodity by an individual. As given in the table 4.1 different quantities of coffee demanded at different prices by an individual.

Table 4.1

Price of commodity (in rupees)	*Quantity demanded (in units)*
2	8
4	6
6	4
8	2

From the above table when the price of coffee is ₹.2.00 the quantity demanded is 8 units. As the price increase from ₹ 2.00 to ₹ 8.00 the quantity demanded is decreased from 8 units to 2 units.

2. Market Demand Schedule. A market consists of all the individuals who want to purchase a commodity. Market demand schedule is defined as the table that shows the different quantities demanded of a commodity at different prices by all the customers of a market in a given period of time. In other words, "quantities of a given commodity which all the customers will buy at all the possible prices at a given period of time." It means the addition of individual demand schedule gives us market demand schedule.

Table 4.2

Price of Coffee (in rupee)	*Demand of Customer 'A'*	*Demand of Customer 'B'*	*Market Demand (units)*
2	8	9	8 + 9 = 17
4	6	8	6 + 8 = 14
6	4	6	4 + 6 = 10
8	2	4	2 + 4 = 06

From the above table 4.2 price of coffee is ₹ 2.00 per unit, demand of customer 'A' is 8 units and demand of customer 'B' is 9 units and the market demand is 17 units. As

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the price rise from ₹ 2.00 to ₹ 8.00 the demand of customer 'A' decrease from 8 units to 2 units and the demand of customer 'B' decrease from 9 units to 4 units. Now the market demand (total demand) decrease from 17 units to 6 units.

4.2.4 Demand Curve

Demand curve is the graphic representation of the relationship between product *price* and the quantity of the product demanded or the demand schedule. Demand curve is defined as the relationship between the prices of the good and the amount or quantity the consumer is willing and able to purchase in a specified time period, given constant levels of the other determinants—tastes, income, and prices of related goods, expectations, and number of buyers.

Definitions

Some definitions of different economists related to Demand Curve given as under:

Leftwich—*"The demand curve represents the maximum quantities per unit of time that customers will take a various prices."*

Lipsey—*"The curve which shows the relation between the price of a commodity and the amount of the commodity that the consumer wishes to purchase, is called demand curve."*

Like demand schedule demand curve is also has two aspects— (1) Individual demand curve and (2) Market demand curve.

1. Individual Demand Curve. The graphic presentation of individual demand schedule is called individual demand curve. In other words the individual demand curve is the curve that shows different quantities of a commodity demanded by an individual customer at the different prices.

As shown in the figure 4.1 on X-axis we take quantity demanded on Y-axis the price of he commodity. DD is the demand curve. At the price of ₹ 8.00 per unit the quantity demanded is 2 units. As the price decrease from ₹ 8.00 to ₹ 2.00 the quantity demanded is increase from 2 units to 8 units. The slope of the demand curve is downwards from left to right. It means that if the price is more, demand is less and if the price is less, demand is more.

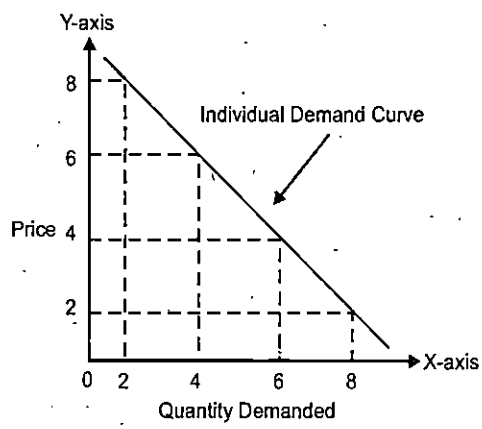

Figure 4.1

2. Market Demand Curve. The graphic presentation of market demand schedule is called market demand curve. In other words the market demand curve is the curve which shows the different quantities of a commodity demanded by all the customers at different prices.

As shown in the figure 4.2 on X-axis the quantity demanded and on Y-axis the price of a commodity. Figure (A) is the demand curve of 'A' and the figure (B) is the demand curve of customer 'B'. The figure (M) is the market demand curve. It is the total of the both curve of customer 'A' and 'B'. If the price is ₹ 8.00 the demand of customer 'A' is 2 units, the demand of customer 'B' is 4 units and the total demand or the market demand is 2 + 4 = 6 units. As the price is fall from ₹ 8.00 to ₹ 2.00 the demand of customer 'A' is increase from 2 units to 8 units, the demand of customer 'B' is also increase from 4 units to 9 units and that's why the demand of market is increase from 6 units to 17 units. The slope of market demand curve is also downwards.

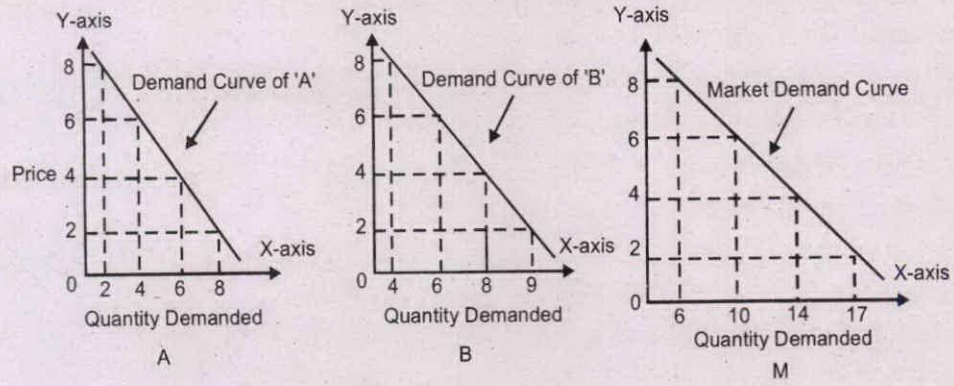

Figure 4.2

4.3 DEMAND CURVE SLOPING DOWNWARDS

The slope of the demand curve is downwards from left to right as shown in the figure above. It means that the demand of a commodity increase as fall in price and decrease as rise in price. It is also related to assumption of law of demand. The following are the reasons of why demand curve sloping downwards:

- The size of the market (size of customers)
- Consumer tastes
- Income of customers (income effect)
- Prices of other related goods (substitution effect)

All of these are directly related to consumers. A change in any one of these will cause the demand curve to shift to the right or left. In other words, at some given price, consumers will be willing and able to purchase either more or less. The above given reasons are explained below:

4.3.1 Size of the Market and Consumer Tastes

Let's cover the easy ones first. If the number of consumers in the market increases such as from population growth there should be a greater number of willing and able buyers

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at some given price. Remember that the market demand curve (schedule) is simply the sum of individual consumer demand curves (schedules). This implies that market demand will increase and the market demand curve shifts to the right. A similar outcome results if there is a change in consumer tastes or desire for a particular product. If a product like low-cut jeans becomes the latest fashion fad, demand at any given price will increase and the demand curve shifts to the right. On the other hand, if there is a decline in the size of the market or a product becomes unfashionable or obsolete then the demand curve shifts to the left.

4.3.2 Income (Income Effect)

You might expect an increase in income to lead to an increase in demand for a product and in most cases you will be right. For normal goods an increase in income means a consumer will purchase more of the good at a particular price, which would cause the demand curve to shift to the right. But there are inferior goods for which an increase in income leads to a decrease in demand.

- **Normal Good**—an increase in income leads to an increase in demand (the demand curve shifts to the right).
- **Inferior Good**—an increase in income leads to a decrease in demand (the demand curve shifts to the left).

Compare a premium brand ice cream with a generic store-branded ice cream. As your income increases you may begin to purchase more premium ice cream and less of the lower quality generic store-branded ice cream. The premium ice cream is a *normal* good while the generic store-branded ice cream is an *inferior* good.

Actually this may not be the best example. Use of the terms *normal* and *inferior* in economics are not meant to indicate a good or bad quality product but only a consumer's response to changes in income. For example, I do most of the remodelling on my home using the scarce resource of my time. I am pretty good at installing hardwood floors and building sheds. But if I had more income I would likely hire a contractor to do the work. The quality difference between my efforts and a contractor's is minimal, but my effort is an inferior good because my demand for it would decline with increasing income, while the contractor's effort is a normal good in that higher income leads to an increase in demand.

4.3.3 Prices of Other Related Goods (Substitution Effect)

The demand for one good can be affected by the price of another related good. For example, consider our demand curve for DVD movies. The demand for DVD movies depends on how many people own DVD players. As the price of DVD players falls and more people buy DVD players (according to the Law of Demand for DVD players) then the demand for DVD movies will increase and the demand curve for DVD movies will shift to the right. This is an example of complements in demand.

- **Complements in Demand**—goods that are normally consumed together (*e.g.*, DVD players and DVD movies). As the price of one complement declines, demand for the other complement will increase.

- **Substitutes in Demand**—goods that are normally consumed in place of each other (*e.g.*, butter and margarine). As the price of one substitute declines, demand for the other substitute will decrease.

Some products may compete with each other like DVD and VHS movies (a more common textbook example is butter and margarine). As the price of VHS movies declines some people will reduce their purchases of DVDs and switch to VHS movies instead. So, as the price of VHS movies declines people buy more VHS movies, the demand for DVDs will decline, and the demand curve for DVDs will shift to the left. This is an example of substitutes in demand.

Complements and substitutes in demand are goods that are *related* to each other. Most goods, however, are basically unrelated. We assume that a change in price of one good has no significant effect on the demand curve for other *unrelated* goods. For example, a decline in the price of hamburger meat may increase the demand for hamburger buns (a complement in demand) and reduce the demand for chicken (a substitute in demand) but it should have no *significant* effect on the demand for air travel, haircuts, milk, and all other unrelated goods and services.

4.3.4 Change in demand v/s Change in quantity demanded

We have introduced two different ways that the quantity of purchases of a good can change. Because of this we must highlight the specific language we have used to distinguish between the two.

First. we said that according to the *Law of Demand* that a change in price will lead to a movement along a stable demand curve and result in a change in the quantity demanded. For example, more will be purchased but only at a lower price. The only thing that can change the quantity demanded is a change in the market price.

Second. we said that if one of the *ceteris paribus* assumptions is violated (*e.g.*, a change in income) there will be a change in demand. Economists use the term "demand" to refer to the entire demand curve. Consequently when we say there has been an increase in demand we mean that the entire demand curve has shifted to the right. More will now be purchased at the same price.

- **Change in Quantity Demanded**. a movement along a fixed demand curve in response to a change in the price of that good, ceteris paribus (everything else unchanged).
- **Change in Demand.** a shift of the demand curve in response to a change in one of the variables assumed to be held constant under the ceteris paribus assumption (*e.g.*, income), holding the good's price constant.

4.4 DETERMINANTS OF DEMAND OR DEMAND FUNCTIONS

The demand of a commodity is depends upon a number of factors which are given below in terms of a demand functions. Demand function for a commodity describes the relationship between quantities of a commodity which customer demanded during a given period of time. The following are the determinants of demand or demand functions:

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$$D = f(T, Px, Pr, Y, P, E)$$

(Here: D-Demand of a commodity, F—Function, T—Tastes, habits and fashion, Px—Price of commodity demanded, Pr—Price of other goods, Y—Income of the customers, P—Population, E—Expectations of the customer)

4.4.1 Tastes, Habits and Fashions (T)

Tastes and fashions change and are also affected by advertising, trends, health considerations etc. If someone is in the habit of buying a packet of cigarettes of a specific brand from a certain shop every morning before work, they are not likely to change this behaviour easily. On the other hand if a popular rock group favours a brand of clothing, young people often emulate their heroes and demand the same clothes.

4.4.2 Price of the Commodity (Px)

In the general way the demand of a commodity is depends on the price of that commodity. Normally, the price of a commodity rise then the demand of that commodity is decrease and in the other way if the price is fall then its demand is increase.

4.4.3 Price of Related Goods (Pr)

The demand of goods or services not only depends on its own price, but also on the price of related goods. Related goods are classified in two categories *i.e.*, (1) Substitutes goods and (2) Complementary goods.

1. **Substitutes Goods.** The higher the price of substitute goods, the higher the demand will be for the original good. For example, if the price of coffee rises, then demand for tea will increase at every price level.
2. **Complementary Goods.** As the price of complements rises, demand for the complement falls and so too will demand for the good in question. When compact-disc players became popular, the demand for compact-discs rises.

4.4.4 Income (Y)

As people's real income rises demand for goods and services tends to rise too (with some exceptions – see inferior goods). It should be noted that the income for a whole country might remain the same but the distribution of the country's income does change. So that if rich people become richer at the expense of poorer people there will be a change in the pattern of demand too.

4.4.5 Population (P)

The size and make-up of the population affects demand. If there is a growing population more food is demanded. If the population is stable but is ageing (like Italy's) things that old people need will increase in demand, for example health care.

4.4.6 Expectations of Future Price Changes (E)

If people expect prices to rise in the near future they will try to beat the increase by buying the good earlier and vice-versa.

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4.5 FACTORS THAT INFLUENCE DEMAND

Law of demand states that other things being equal, as the price of a good increase, the quantity demanded of that good decrease. But what happened if one of the "other things" changes? For example, how would an economic recession affect the demand for Reebok shoes? How would an increased marketing campaign by Reebok affect the demand for its shoes? What would happen in July if Reebok announced that it would be raising all of its shoe prices in September in response to increased costs of rubber and other materials? The demand relationship in each of these cases would change.

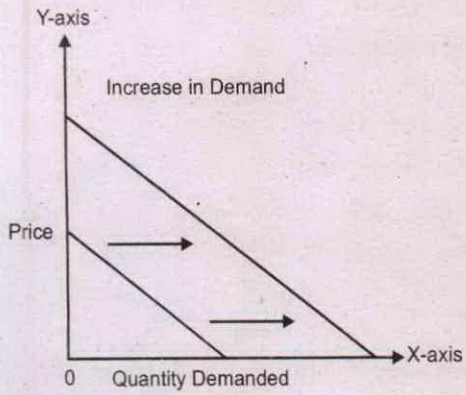

Figure 4.3

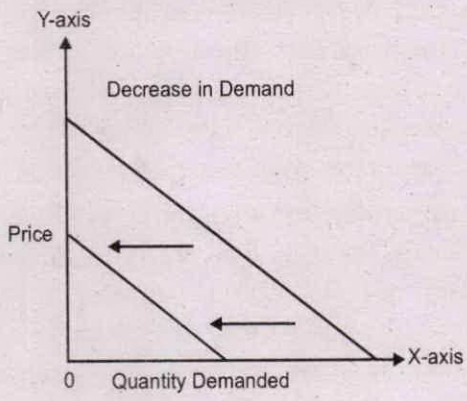

Figure 4.4

When an important factor other than the price of a good itself changes, a change in demand for that good may occur. In the Reebok shoes example, an increase in demand means that consumers are now willing to purchase more shoes at each price. Graphically, an increase in demand appears as a rightward (upward) shift of the demand curve.

Similarly, a decrease in demand for Reebok shoes means that consumers are willing to purchase fewer shoes at each price than previously. Graphically, a decrease in demand appears as a leftward (downward) shift of the demand curve.

Mathematically, an increase or a decrease in demand appears as an increase or a decrease in the y-intercept respectively:

4.5.1 Change in Quantity Demanded vs. Change in Demand

A change in quantity demanded occurs when the price of the good alone changes. A change in demand results from a change in one of the factors other than price. When price alone changes, no "shift" occurs in the underlying relationship, you simply move to a higher or lower price-quantity pair along the same demand curve. The following are the primary factors that can cause of change in demand or shift in the demand curve:

1. Consumer income
2. Prices of related goods
3. Advertising and consumer preferences
4. Population
5. Seasonal factors
6. Expectations

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1. Consumer Income. An increase in consumer income means consumers can afford to purchase more of all goods. In general, you can expect the demand for most goods to increase when consumer income increases. The demand for certain items, however, such as public transportation, may actually decrease as income increases because consumers can afford more desirable alternatives. A good for which demand decreases when income increases is an inferior good; a good for which demand increases when income increases is a normal good.

2. Prices of Related Goods. Changes in the prices of related goods (substitutes and complements) lead to changes in demand. A decrease in the price of a substitute good can cause demand to decrease. For example, assume that ice cream is a substitute good for frozen yoghurt. A decrease in the price of ice cream can cause demand for yoghurt to decrease. A decrease in the price of a complement good can cause demand to increase. For example, if Reebok put its athletic apparel on sale (sports shoes and athletic wear are complement goods), the demand for its shoes may increase.

3. Advertising and Consumer Preferences. If consumer preferences change so that consumers get more fulfilment from consuming a good, whether the result of a firm's advertising or outside forces, demand for the good will increase. Demand for Reebok's running shoes might increase if Reebok ran commercials in which Olympic track stars endorsed its shoes, or if a medical report announced some new health benefits from jogging.

4. Population. An increase in the population of consumers will increase demand. For example, as the baby boomer generation ages and the population of elderly Americans grows, the demand for health care and related services in the United States will increase.

5. Seasonal Factors. Seasonal factors can also affect the demand for a product. Buyers purchase certain products heavily during certain times of the year. For instance, the demand for children's toys will be higher during the Christmas season (often the fourth quarter) than during other times of the year.

6. Expectations. Finally, if consumers' expectations about the price of a good change demand for the good will change. For instance, if consumers expect prices to rise in the near future, they may demand more of a good today. The opposite is true if consumers expect prices to fall in the future. Homebuyers may delay home purchases if they expect the housing market to be more attractive in a year.

4.6 INTER-RELATED DEMAND

Inter-related demand may be defined, if the demand of a commodity is depends on the demand of the other commodity. The demand for all goods is effectively related because all goods compete for the scarce, the increase in the price of one good can affect all other purchases. For example, the demand of butter is depends on the demand of bread. Following are the different types of inter-related demands:

1. Complementary Demand. Demand for a product generated by the demand for a related but different product, such as by computers for software, vehicles for tires,

shaving razors for blades. It is also called joint demand. The products demanded jointly are called complementary product.

2. Composite Demand. Demand arises from several sources, and an increase in demand for the particular good for use in a certain sector will decrease the availability of the good for use in another sector. For example, Electricity for Domestic or Commercial Uses.

3. Competitive Demand. The goods are substitutes for each other. A rightward shift in the demand curve of one product will result in a leftward shift of the demand curve of the other product. This is most evident in cases where consumers switch to a cheaper commodity to maximise their satisfaction using their fixed disposable income. For example, Chicken or Duck.

4. Derived Demand. Demand for one good is derived from the demand for another good. This is keen to Complementary Demand, but different in that for Derived Demand, one good is involved in the production process of the other good. For example, iron and the Steel used to make cars.

4.6.1 Application of Law of Demand

The following are the various importance or applications of law of demand:

1. Price Determination. The law of demand plays an important role in the determination of the price of a commodity under monopoly competition. A monopolist is able to know how much amount demanded for his commodity, shall go up or down with change in price.

2. Useful for Manufacturer. The low of demand has more importance for the sellers or the manufacturers of the products and services. The manufacturers are faced the problem like — how much his sale decrease if he rises the price of his products and services and how much his sale expand if lowers the price of his commodities.

3. To the Finance Minister. The low of demand is very useful to the finance minister of the state. The minister can estimate the total revenue from a tax by careful reduces its sale to a large extent. It is not a good policy of taxation for that commodity, only such commodities be taxed, that have relatively inelastic demand.

4. For Framers. A good or bad corps effect the economic condition of the farmers can be found out from the law of demand. If this is a good crop and demand for it remains same, price will definitely go down.

4.7 SUMMARY

- In the normal way the meaning of demand, desire, want and need are same. But in the economics all these terms have different meaning. Desire is a wish for a thing.
- In economic word the demand is made to show the relationship between the prices of a commodity and the amounts of the commodity which customer wants to purchase at given prices.

NOTES

- The law of demand states that, if all other factors remain equal, the higher the price of a goods, the less people will demand that goods. In other words, the higher the price, the lower the quantity demanded.
- Demand curve is the graphic representation of the relationship between product *price* and the quantity of the product demanded or the demand schedule.
- The individual demand curve is the curve that shows different quantities of a commodity demanded by an individual customer at the different prices.
- The market demand curve is the curve which shows the different quantities of a commodity demanded by all the customers at different prices.
- Demand function for a commodity describes the relationship between quantities of a commodity which customer demanded during a given period of time. The following are the determinants of demand or demand functions:

$$D = f(T, Px, Pr, Y, P, E)$$

- Inter-related demand may be defined, if the demand of a commodity is depends on the demand of the other commodity.

4.8 REVIEW QUESTIONS

1. What do meant by demand? Explain its various aspects.
2. Explain the law of demand with the help of demand schedule and demand curve.
3. Define demand and what are the determinants of demand?
4. What do you understand by demand? Describe about the demand curve.
5. Explain individual and market demand or demand curve.

UNIT 5: ELASTICITY OF DEMAND

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STRUCTURE

5.1 ELASTICITY

Elasticity is the relative response of one variable to changes in another variable. Elasticity is commonly used in the study of market exchanges to identify the relative response of quantity (demanded and supplied) to changes in price. The phrase "relative response" is best interpreted as the percentage change, such as, the percentage change in quantity measured against the percentage change in price. The most common notions of elasticity are the price elasticity of demand and the price elasticity of supply.

The concept of elasticity is used throughout the study of economics, but is perhaps most important in the analysis of markets. It provides quantitative structure to the concepts of demand and supply, making it possible to summarize each side of the market into single elasticity measures, the demand curve on one side and the supply curve on the other.

Although elasticity most often surfaces in the study of markets, it is applied to a wide range of economic topics involving a connection or cause-and-effect relation between two variables. The analysis of short-run production by a firm often finds use for elasticity of substitution between labour and capital inputs. The analysis of monetary policy employs the interest rate elasticity of investment expenditures.

5.2 ELASTICITY OF DEMAND

The quantity demanded of a good is affected by changes in the price of the good, changes in prices of other goods, changes in income and changes in other relevant factors. Elasticity is a measure of just how much the quantity demanded will be affected by a change in price, income, price of other goods etc.

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Elasticity is a measure of the responsiveness of one variable to changes in some other variable. The concept of elasticity is used throughout the study of *economics*, but is perhaps most important in the analysis of *markets*. It provides quantitative structure to the concepts of *demand*. Elasticity of demand is a qualitative statement. Thus, the elasticity of demand refers to the percentage change in quantity demanded of a commodity as a result of a percentage change in its price.

Elasticity of demand indicates the responsiveness of demand to change in its determinents, for instance, price, price of other goods and income of customers. It measures the responsiveness of the quantity demanded of a good to its price.

Definitions

Some definitions of different economists related to Elasticity of Demand given as under:

Prof. Samuelson—*"Elasticity of demand is a concept derived to indicate the degree of responsiveness of quantity (Q) demanded to change in the market price (P). It depends primarily on percentage changes and it is independent of units used to measure Q and P."*

Prof. Marshall—*"The elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price and diminish much or little for a given rise in price."*

Prof. Robinson—*"The elasticity of demand of an output is the proportional change of amount purchased in the response to a small change in price divided by the propionate change in price."*

Prof. Eastham—*"Elasticity of demand is the measure of responsiveness of quantity demanded to a change in price of a commodity."*

Elasticity of demand is the measure of the degree of change in the amount demanded of the commodity in the response to a change in the price of that commodity, price of some other related commodity and changes in the income of the customers."

5.2.1 Types of Elasticity of Demand

From the above definitions we find out that the quantity demanded of a commodity depends upon the three factors like price of that commodity, price of other commodity and the income of the customers. On the basis of this definition elasticity of demand can be mainly of three types *i.e.,* (1) Price Elasticity of Demand (2) Income Elasticity of Demand and (3) Cross price Elasticity of Demand. Now, we study these three types of elasticity of demand in detail one by one as follows:

5.3 PRICE ELASTICITY OF DEMAND

The relative response of a change in quantity demanded to a change in price. More specifically the price elasticity of demand is the percentage change in quantity demanded due to a percentage change in price. In the general way the price elasticity of demand is called elasticity of demand. Because price is the changeable factor that influenced demand. Elasticity of demand measure the responsiveness of demand to change in price.

$$\text{Price elasticity of demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

The concept of price elasticity of demand is explained with the help of an example. Suppose the fall in price is 20 percent and the result increase in demand is 30 percent. Then the elasticity of demand is calculated as follow:

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$$E = \frac{30\%}{10\%} = 3\%$$

Definitions

Some definitions of different economists related to Price Elasticity of Demand given as under:

A.K. Cairncross—*"The price elasticity of demand for a commodity is the rate at which quantity brought changes as the price change."*

Dr. Marshall—*"The price elasticity of demand may be defined as the percentage change in the quantity demanded divided by percentage change in the price."*

Antol Murad—*"The price elasticity of demand is the ratio of relative change in quantity to relative change in price."*

5.3.1 Degrees of Price Elasticity of Demand

The price elasticity of demand is different from one commodity to other commodity, at different prices, it is not always same. In the other way some commodity are more elastic than other, some way some commodity are more elastic and others are inelastic. The price elasticity of demand is commonly divided into one of five elasticity alternatives— (1) Perfectly elasticity Demand (2) Perfectly inelasticity Demand (3) Unity elasticity Demand (4) Relatively elasticity Demand or Greater than Unity (5) Relatively inelasticity Demand or Less than Unity —depending on the relative response of quantity to price. These five alternatives form a continum of possibilities.

1. Perfectly Elasticity Demand. The perfect elasticity of demand is that in which a little changes in price of a commodity cause infinitely large changes in quantity demanded

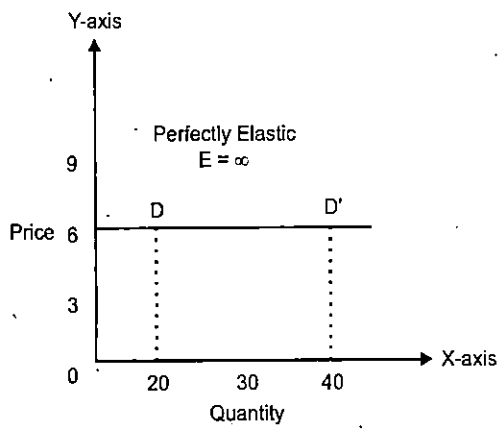

Figure 5.1

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of that commodity. Quantity is infinitely responsive to price. Any change in price, no matter how small, triggers an infinite change in quantity. Perfectly elasticity demand can occur, in theory, when buyers have the choice among a large number of perfect substitutes in the consumption of a good.

A good is considered perfectly elastic when the price elasticity of demand approaches infinity. This implies that the demand for the product is unlimited at the market price—the demand curve is horizontal or parallel to X-axis.

This would mean that a small change in price would lead to an infinitely large increase in Demand. In perfectly competitive markets (such as, say, coal), if you can charge slightly less than your competitors, and still make a profit, you will find your customers will attempt to buy as much as you can produce.

As shown in figure DD' is the perfect elastic demand curve. If there is little change in price from ₹ 6.00, there is large change in demand from 20 units to 40 units.

2. Perfectly Inelasticity Demand. The perfectly inelasticity demand is that in which changes in price do not cause any changes in quantity demanded of a commodity.

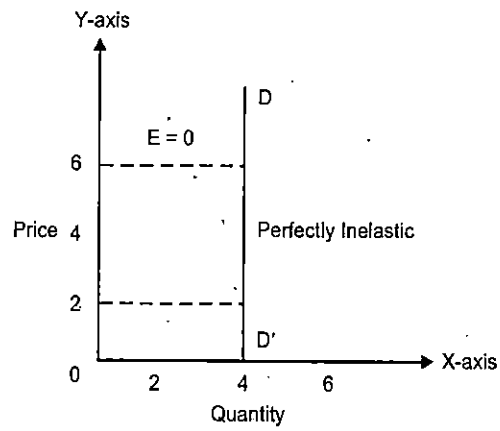

Figure 5.2

Quantity is totally, completely unresponsive to price. Quantity just does not change, regardless of changes in price.

A good is considered perfectly inelastic when the price elasticity of demand equals zero. This implies that changes in price have no effect on the quantity demand of a good—the demand curve is vertical or parallel to Y-axis.

Perfectly inelastic means that quantity demanded is unaffected by any change in price. In other words, the quantity is essentially fixed. It does not matter how much price changes, quantity does not budge. Perfectly inelastic demand occurs when buyers have no choice in the consumption of a good. The key for perfectly inelastic demand is that the good has absolutely no substitutes-in-consumption. Buyers either buy the good, or they buy the good. They can not switch to a substitute good if the price gets a little too high. Thus change in price causes no change in demand. In this condition elasticity of demand is equal to zero or E = 0 (zero).

3. Unity Elasticity Demand. The unity elasticity of demand is that in which changes in price cause equal proportional changes in quantity demanded of a commodity. In other words, any change in price, whether big or small, triggers exactly the same percentage change in quantity demanded. Quantity changes match price changes.

A good has unitary elasticity when the price elasticity of demand exactly equals one. Unity elasticity means that any change in price causes an equal proportion change in quantity demanded. Quantity changes are matched by price changes. More specifically, the percentage change in quantity is equal to the percentage change in price. Unity elasticity demand occurs when buyers can choose from among a modest number of substitutes in the consumption of a goods.

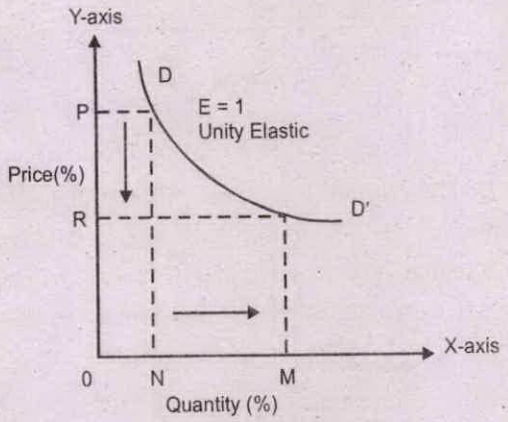

Figure 5.3

Unity elasticity demand curve is, in fact, a curve (rather than a straight line), while the unit elastic supply curve is a straight line that originates from the origin. Curves is configured such that a given percentage change in price is matched by an equal percentage change in quantity. The key for demand is that the slope of the curve is steep for high prices and small quantities and flat for low prices and large quantities.

As shown in figure, DD′ is the unity elastic demand, in which percentage change in price is equal to the percentage change in demand. In this condition elasticity of demand is equal to one or E = 1 (one).

4. Relatively Elasticity Demand or Greater than Unity. Relatively elasticity demand is that in which relatively small changes in price cause relatively large changes in quantity demanded of a commodity. In other words, quantity is very responsive to price. Quantity changes a lot in response to small changes in price.

A good is considered to be relatively elastic when the price elasticity of demand exceeds an absolute value of 1. This indicates that if the price of the good changes by 1%, the response in the quantity demand is greater than 1%. The demand curves for elastic goods are relatively flat in slope.

Relatively elasticity means that relatively small changes in price cause relatively large changes in quantity demanded. In other words, quantity is very responsive to price. More specifically, the percentage change in quantity is greater than the percentage change in price. Relatively elastic demand occurs when buyers can choose from among a large

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number of very close substitutes-in-consumption. In this condition elasticity of demand is more than one or E >1.

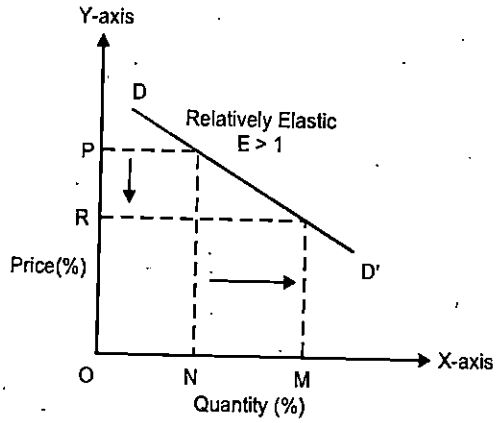

Figure 5.4

5. Relatively inelasticity Demand or Less than Unity: Relatively inelasticity Demand is that in which relatively large changes in price causes relatively small changes in quantity demanded of a commodity. In other words, quantity is not very responsive to price. Quantity does change, but not much, in response to large changes in price.

A good is considered to be relatively inelastic when the price elasticity of demand is below an absolute value of 1. This indicates that if the price of the good changes by 1%, the response in the quantity demand is less than 1%. The demand curves for inelastic goods are relatively steep in slope.

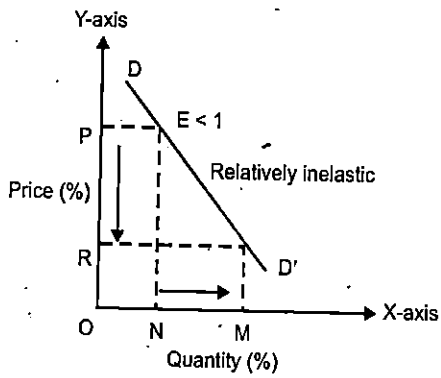

Figure 5.5

Relatively inelastic demand means that relatively large changes in price cause relatively small changes in quantity. More specifically, the percentage change in quantity is less than the percentage change in price. Relatively inelastic demand occurs when buyers can choose from among a small number of imperfect substitutes-in-consumption. In this condition elasticity of demand is less than one or E<1.

Note: *In the above curves of degrees of elasticity of demand on X-axis we take the Quantity demanded and on the Y-axis we take price of the commodity. DD' is the demand curve.*

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Table 5.1 **Value of Elasticity Co-efficient and their Description**

Sr. No.	*Value of Elasticity Co-efficient*	*Degree of Elasticity*	*Description*
1.	$E = \infty$	Perfectly elastic Demand	Change in price causes infinitely large change in quantity demanded
2.	$E = 0$	Perfectly inelastic Demand	Change in price do not causes any change in quantity demanded
3.	$E = 1$	Unity elastic Demand	Change in price causes equal proportional change in quantity demanded
4.	$E > 1$	Relatively elastic Demand or greater than Unity	Change in price causes relatively large change in quantity demanded
5.	$E < 1$	Relatively inelastic Demand or Less than Unity	Changes in price causes relatively small changes in quantity demanded

5.3.2 Measurement of Price Elasticity of Demand

The price elasticity of demand is of five types such as (1) Perfectly elasticity Demand (2) Perfectly inelasticity Demand (3) Unity elasticity Demand (4) Relatively elasticity Demand (5) Relatively inelasticity Demand. The measurement of perfectly elastic and perfectly inelastic demand is not possible. But the unity, relatively elastic or greater than unity and relatively inelasticity or less than unity elasticity of demand are measured with the help of following five methods:

1. Total Expenditure Method
2. Percentage or Proportionate Method
3. Point Elasticity Method
4. Arc Elasticity Method
5. Revenue Method

Now these methods for measuring the price elasticity of demand are explained in detail as following:

1. Total Expenditure Method. The total expenditure method for measuring price elasticity of demand is also called Outlay Method. This method is developed by **Prof. Marshall.** According to this method the price elasticity of demand can be measured from the change in the expenditure of the customer on a commodity as the price of that commodity is changed. It means for measuring the price elasticity of demand by this method, it is necessary to know how much and in what direction the total expenditure of a customer is changed as the price of a commodity is changed. Cases of price elasticity of demand related to the change in total expenditure as the price of a commodity is changed:

1. If there is fall or rise in price of a commodity, the total expenditure of a customer is remaining same, and then it will be a case of unity elasticity of demand.

NOTES

2. If there is fall in price of a commodity, the total expenditure of the customers is goes up and if the price of a commodity is rise the total expenditure of customer is goes down. It means the price and total expenditure are moves in the opposite direction, and then it will be a case of relatively elasticity or greater than unity elasticity of demand.
3. If there is fall in price of a commodity, the total expenditure of the customers is goes down and if the price of a commodity is rise the total expenditure of customer is goes up. It means the price and total expenditure are moves in the same direction, and then it will be a case of relatively inelasticity or less than unity elasticity of demand.

The total expenditure method for measuring the price elasticity of demand is also explained with the help of given two tables—5.2, and 5.3:

Table 5.2 Total Expenditure Method

Price	*Total Expenditure*	*Elasticity of demand*
Rise	Unchanged	Unity
Fall	Unchanged	
Rise	Down	Relatively elasticity or Greater than unity elasticity of demand
Fall	Up	
Rise	UP	Relatively inelasticity or Less than unity elasticity of demand
Fall	Down	

Table 5.3 Total Expenditure Method

Price (Rupee)	*Quantity Demanded (Kg)*	*Total Expenditure*	*Change in Total Expenditure*	*Elasticity of Demand*	*Condition*
3	4	12			
		} ⟶	Unchanged		
4	3	12		Unity	(A)
		} ⟶	Unchanged		
2	6	12			
3	4	12			
		} ⟶	Less Total Expenditure	Greater	
4	2	8		than	(B)
		} ⟶	More Total Expenditure	Unity	
2	5	10			
3	2	6			
		} ⟶	More Total Expenditure	Less	
4	3	12		than	(C)
		} ⟶	Less Total Expenditure	Unity	
2	4	8			

NOTES

Explanation

This table 5.3 for the measurement of price elasticity of demand is explained as follow:

Condition (A) Unity elasticity of demand, according to this table if the price of a commodity is rise from ₹ 3.00 to ₹ 4.00 or fall to ₹ 2.00, the total expenditure is remain unchanged, *i.e.*, ₹ 12.00. It means change in price has no effect on total expenditure.

Condition (B) Greater than unity, according to this table if the price of a commodity is rise from ₹ 3.00 to ₹ 4.00, the total expenditure is goes down from ₹ 12.00 to ₹ 8.00, if the price is fall from Rs. 4.00 to ₹ 2.00 the total expenditure is goes up from ₹ 8.00 to ₹ 10.00, it means the total expenditure is change in opposite direction as a result of change in price of a commodity.

Condition (C) Less than unity, according to this table if the price of a commodity is rise from ₹ 3.00 to ₹ 4.00, the total expenditure is goes up from ₹ 6.00 to ₹ 12.00, if the price is fall from ₹ 4.00 to ₹ 2.00 the total expenditure is goes down from ₹ 12.00 to ₹ 8.00, it means the total expenditure is change in same direction as a result of change in price of a commodity.

As shown in the figure 5.6 on X-axis we take total expenditure and on Y-axis price of the commodity, TE is the total expenditure curve. BC is the part of TE which shows the unity elasticity of demand, as the price is changed from OQ to OR, the total expenditure is remain unchanged (QC = RB). In the TB part of TE, as the price is rise from OR to OS the total expenditure is goes down from RB to SA, it moves in opposite direction. In the EC part of TE, as the price is rise from OP to OQ the total expenditure is goes up from PD to QC, it moves in the same direction as price.

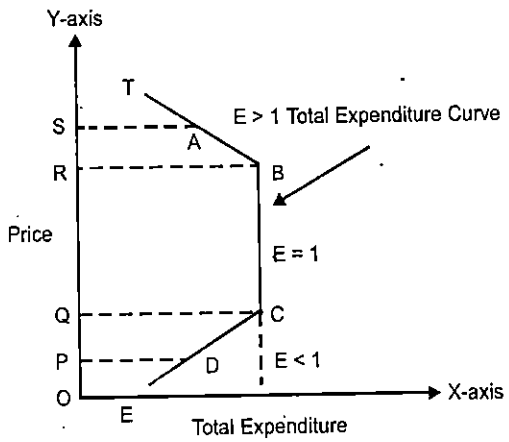

Figure 5.6

2. Proportionate or Percentage Method. Proportionate or percentage is the second method for measuring the price elasticity of demand. In this method the price elasticity of demand is calculated by dividing the percentage change in quantity demanded by the percentage change in price of a commodity.

NOTES

Percentage change in quantity demanded

$$E = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

$$E = \frac{\text{Change in quantity demanded}}{\text{Original quantity demanded}} \div \frac{\text{Change in price}}{\text{Original price}}$$

$$E = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P} = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P}$$

(Here: Q—original quantity demanded, ΔQ—change in quantity demanded, P—original price, ΔP—change in price).

Schnider and **Bilas** suggest that to measure the price elasticity of demand by the percentage method, we just not take the original price and original demand. This is more batter to take lower value of the original price and the lower value of quantity demanded instead of original demand and price. By taking lower values of Q and P ensure a lower value of the price elasticity of demand.

For Example: Suppose the price of milk is ₹ 6.00 per it. and the amount demanded is 5 litre. When the price is reduced to ₹ 5.00, the amount demanded is increase to 6 litre. According to the total expenditure method the elasticity of demand is one, because the expenditure is remain same as change in price.

Applying the percentage method, P = 6, ΔP = –1, Q = 5, ΔQ = +1

$$E = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P} = \frac{6}{5} \times \frac{1}{-1} = \frac{-6}{5} = -1.2$$

Now using the formula of lower quantity and price:
P = 6 but P1 = 5 and Q = 5, Q1 = 6
By using the lower values of P and Q

$$E = \frac{P}{Q} = \frac{6}{5} = 1.2$$

It is same as to the price elasticity of demand find out by using the total expenditure method, so it is a best to take lower values of demand and price.

3. Point Elasticity Method. The point elasticity method for calculating the price elasticity of demand was evaluated by Prof. Marshall. This method is also called graphic method. Point elasticity refers to the price elasticity of demand at any point on the demand curve. Price elasticity of demand is different at the different points on a given demand curve and it is calculated separately for each and every point on the demand curve. According to this method price elasticity of demand can be measured with the help of the following formulas:

$$\text{Price elasticity of demand} = \frac{\text{Lower portion of the demand curve}}{\text{Upper portion of the demand curve}}$$

If (1) Lower portion > Upper portion (E > 1)

(2) Lower portion < Upper portion (E < 1)

(3) Lower portion = Upper portion (E = 1)

NOTES

For measuring the price elasticity of demand the demand curve is divided in two parts— (1) Straight line demand curve and (2) Concave demand curve.

Straight Line Demand Curve

As shown in the figure 5.7, NM is the straight line demand curve. At the point 'A' of the demand curve NM, the elasticity of demand is equal to AM/AN. It is find with the help of the following formula:

$$E = \frac{P}{Q} \times \frac{\Delta Q}{\Delta P}$$

It means the elasticity of demand is equal to the "lower portion of demand curve is divided by upper portion of demand curve."

$$\text{Elasticity of demand} = \frac{\text{Lower portion of demand curve}}{\text{Upper portion demand curve}}$$

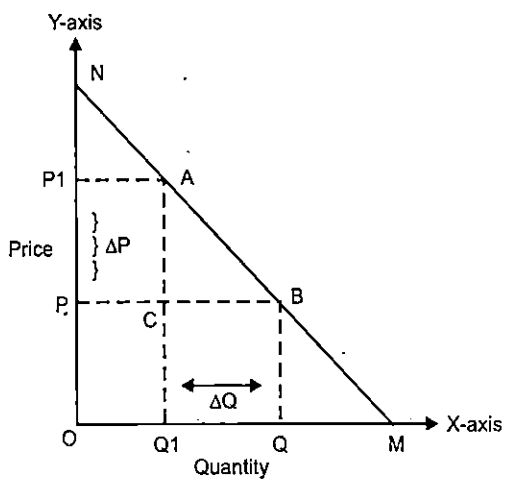

Figure 5.7

As shown in the figure 5.8 below NM is the straight line demand curve and B is the midpoint of NM, where the value of upper portion (BN) is equal to the lower portion (BM) of the demand curve. Hence, the following conditions are comes:

1. Unity Elasticity of Demand. At point B on the demand curve NM the elasticity of demand is equal to one, because the value of BM is equal to the BN. From the above formula, E = BM/BN = 1, (BM = BN).

2. Greater than Unity. At point C on the demand curve NM the elasticity of demand is greater than one, because the value of CM is greater than CN. From the above formula, E = CM/CN > 1, (CM>CN).

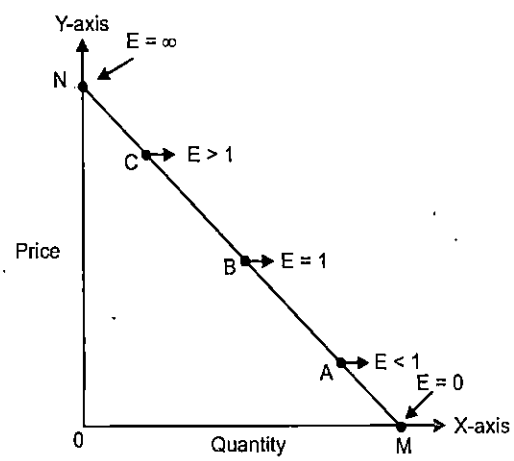

Figure 5.8

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3. Less than Unity. At point A on the demand curve NM the elasticity of demand is less than one, because the value of AM is less than AN. From the above formula, E = AM/AN < 1, (AM< AN).

4. Infinity Elasticity of Demand. At point N on the demand curve NM the elasticity of demand is equal to infinity.

5. Zero elasticity of demand. At point M on the demand curve NM the elasticity of demand is equal to zero.

Concave Demand Curve

As shown in the figure 5.9, CD is the concave demand curve. If the demand curve is concave the elasticity of demand is measured at a point on that curve, by plotting a tangent on that concave curve. Which is touching the point of demand curve, on which we have to find the elasticity of demand?

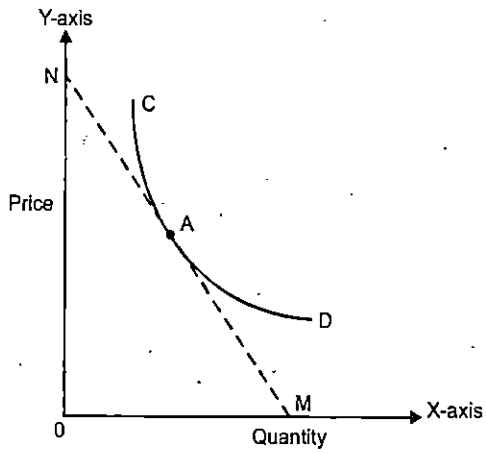

Figure 5.9

CD is the concave demand curve. 'A' is the point on which we have to find the elasticity of demand. We draw a tangent NM on the point 'A' of the demand curve. The elasticity at this point is given by the ratio of the distance along the tangent to X-axis divided by the distance to the Y-axis. Elasticity of demand is AM/AN.

Note. *The proportionate and point elasticity method of measuring price elasticity of demand are used if there is an infinite small change in price and quantity demanded.*

4. Arc Elasticity Method. The point elasticity method for measuring price elasticity of demand is useful only when there are minute change in price and quantity demanded, whereas the **Arc** method is very useful when the change in price and demand very large. Arc elasticity formula was advocated by R. G. D. Allen due to the following properties:

1. Symmetric with respect to the two prices and two quantities.
2. Independent of the units of measurement.
3. Yield a value of unity if the total revenues at two points are equal.

Normally the elasticity varies along the length of demand curve. If we are to measure elasticity between any two points on the demand curve, then the Arc elasticity methods, is used. Arc elasticity is a measure of average elasticity between any two points on the demand curve. It is defined as the average elasticity of a range of points on a demand curve.

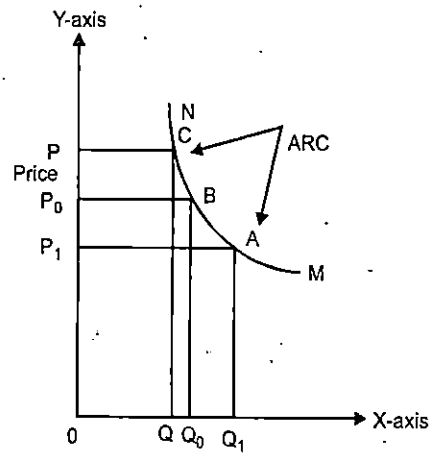

Figure 5.10

As shown in the figure 5.10, NM is the demand curve. Price elasticity of demand is measured at point C. If the price is fall two conditions are created *i.e.*, B and A. These are explained as following:

1. At point B the price is fall from OP to OP_0, and quantity demanded is changed from OQ to OQ_0.
2. At point A the price is fall from OP_0 to OP_1, and quantity demanded is changed from OQ_0 to OQ_1.

The stretch between the two points A and C on the concave demand curve NM is called arc as shown in figure. Price elasticity of this arc is called arc elasticity of demand. The arc elasticity of demand is measured by the help of following formula.

E = – (Change in quantity divided by average quantity)/(Change in price divided by average price)

$$E = \frac{(Q_0 - Q)/(Q_0 + Q)/2}{(P_0 - P)/(P_0 + P)/2}$$

$$E = \frac{(Q_0 - Q)/(P_0 + P)/2}{(P_0 - P)/(Q_0 + Q)/2}$$

$$E = \frac{(Q_0 - Q)/(P_0 + P)}{(P_0 - P)/(Q_0 + Q)}$$

$$E = \frac{\Delta Q}{\Delta P} \times \frac{(P_0 + P)}{(Q_0 + Q)}$$

(Here, Q—Initial quantity demanded, Q_0—New demand, P—Initial price, P_0—New price, ΔQ—Change in quantity demanded, ΔP—Change in price).

For example, Suppose the price of milk is ₹ 6.00 per litre and the amount demanded is 5 litre. When the price is reduced to ₹ 5.00, the amount demanded is increase to 6 litre. According to the total expenditure method the elasticity of demand is one, because the expenditure is remain same as change in price. Now using the arc elasticity, $\Delta P = -1$, $\Delta Q = +1$, $P = 6$, $P_0 = 5$, $Q = 5$, $Q_0 = 6$

$$E = (-)\frac{\Delta Q}{\Delta P} \times \frac{(P_0 + P)}{(Q_0 + Q)}$$

$$E = (-)\frac{+1}{-1} \times \frac{(5+6)}{(6+5)} = 1$$

Now, we find same price elasticity of demand as find by the total expenditure method, it means this method is more accurate than point elasticity.

5. Revenue Method. Revenue is the total amount of money that the firm has earned from the sale of all its goods and services during a given time period. If a firm produced just one product or service the sales revenue would be the price of the product multiplied by the number of the product sold. In the case of more than one product or service the revenue from each needs to be added together.

NOTES

Supposing by selling of 10 units of a commodity, a firm gets ₹ 50.00, and then this amount of ₹ 50.00 is called total revenue of the firm. When the total revenue is divided by the number of units sold is called average revenue or price per unit of commodity. It is equal to 50/10 *i.e.*, ₹ 5.00 per kg. It means average revenue and price per unit are similar terms.

Addition made to the total revenue by the sale of one more unit is called marginal revenue. If by selling of one more unit of that commodity, the total revenue is goes up to ₹ 54.00. Thus the marginal revenue of the 11^{th} unit of the commodity is ₹ 54 – ₹ 50 = ₹ 4.00. Now the price elasticity of demand is measured by the help of average revenue and marginal revenue as following:

$$\text{Elasticity of demand} = \frac{\text{Average Revenue}}{\text{Average Revenue} - \text{Marginal Revenue}}$$

$$E = \frac{AR}{AR - MR}$$

(Here, E—Price elasticity of demand, AR—Average Revenue, MR—Marginal Revenue)

Explanation of Revenue Method

As shown in figure 5.11, on X-axis quantity demanded of a commodity and on Y-axis revenue. AC is the demand curve (average revenue). AH is the marginal revenue curve. We have to find out the price elasticity of demand on the point 'B' on the average revenue curve. It is given below:

$$E = \frac{\text{Lower portion of average revenue curve}}{\text{Upper portion of average revenue curve}} = \frac{BC}{BA}$$

ΔABD and ΔBCG are similar, then the ratio of there sides are also equal.

$$E = \frac{BC}{BA} = \frac{BG}{AD} \quad \text{.....equation (1)}$$

ΔEBF and ΔADE are congruent triangles, it means BF = AD. Putting the value of BF in equation (1).

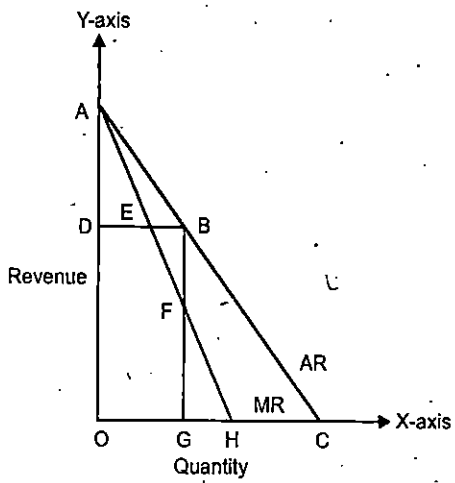

Figure 5.11

$$E = \frac{BG}{BF}$$

Value of BF is equal to the BG – FG, then the above equation become

$$E = \frac{BG}{BG-FG}$$ the value of BG = AR and FG = MR.

Then $$E = \frac{AR}{AR-MR}$$

"Price elasticity of demand is unity if the value of E is one; greater than unity if E is more than one and less than unity if E is less than one."

NOTES

Table 5.4

Value of E	*Type of Price Elasticity of Demand*
E = 1	Unity elasticity
E > 1	Greater than unity
E <1	Less than unity

5.3.3 Determinants of Price Elasticity of Demand

The price elasticity of demand depends upon a number of factors. Some of them given below:

1. Nature of Commodity. Because necessities are goods that people *need* to consume, they tend to have an inelastic demand. This means that when the price of a necessity rises, quantity demanded for the necessity does not change much. Luxuries, on the other hand, are not goods that people *need* to consume (people just consume them if they are able). Because of this, an increase in the price of a luxury tends to be associated with a large decrease in the quantity demanded for the luxury. Economists usually find that luxuries have elastic demand.

2. Availability of Substitutes. Products that have readily available substitutes tend to have elastic demand. This is because consumers will switch to the available substitute when the price of the product rises, causing a large decrease in quantity demanded. When products do not have readily available substitutes, consumers are not able to switch when the price of the product rises —therefore the decrease in quantity demanded will be smaller. Products without readily available substitutes tend to have more inelastic demand.

3. Definition of the Market. The more restrictive is your definition of a market, the more inelastic will be the product demand. As an example, think of the price elasticity of demand for clothing versus the price elasticity of demand for blue jeans. There are many more substitutes for blue jeans than for clothing in general, and the price elasticity of demand for blue jeans is likely to be more elastic.

4. Time Horizon. Most products have more elastic demand over a longer period of time. The reason is that more substitutes will become available in the future than are currently available. Additionally, people may simply modify their consumption behaviour in the future.

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5. Size Matters. Price elasticity of demand is also likely to be smaller when your total expenditure on the item is small—when it is a small ticket item. For example, if the price of paper clips rose substantially it is unlikely that you would reduce your demand since total expenditures on paper clips is still very small and the change would have virtually no impact on your total budget.

6. Durability. If you have an item that is durable, you would expect demand to be more responsive to price changes. When an item is durable you will not need to buy it if the price rises because you can put off your purchase and still receive the benefits from your previous purchase. If the price of garden tools rose, you could use your old tools because they are durable, but if the price of milk rose, it is unlikely that you will be able to get by with using milk that you bought last month.

7. Level of Income of Customers. Price elasticity of demand for a commodity also depends upon the income of the customers. People having very high or low income, have inelastic demand. It is because rise of fall in price has little effect on their demand. On the other hand, demand of middle income people is elastic. Rise in price of commodity demand by these people is decrease.

8. Joint Demand. Price elasticity of demand depends upon the nature of price elasticity of joint-demanded commodities. For example, pen and ink, bread and butter, car and petrol etc. if demand of car is inelastic, the demand for petrol is also inelastic.

9. Peak and Off-peak Demand. Demand tends to be price inelastic at peak times—a feature that suppliers can take advantage of when setting higher prices. Demand is more elastic at off-peak times, leading to lower prices for consumers. For example, consider the charges made by car rental firms during the course of a week, or the cheaper deals available at hotels at weekends and away from the high-season. Train fares are also higher on Fridays (a peak day for traveling between cities) and also at peak times during the day.

5.4 INCOME ELASTICITY OF DEMAND

The Income elasticity of demand of a particular product depends not only on its own price and on the price of other related products, but also on other factors such as income. Income elasticity of demand measures the relationship between change in quantity demand of a commodity and change in income of customer. In other words, income elasticity of demand is the rate at which quantity demanded changes as a result of change in the income of customer, other things remain constant.

Definitions

Some definitions of different economists related to Income Elasticity of Demand given as under:

G. Lipsey—*"The responsiveness of demand to change in income termed as income elasticity of demand."*

Watson—*"Income elasticity of demand means the ratio of the percentage change in the quantity demanded to the percentage change in income."*

he concept of income elasticity of demand therefore measures the percentage change n quantity demanded of a given product due to a percentage change in income. The neasures of income elasticity of demand may be either positive or negative numbers and nese have been used to classify products into "normal" or "inferior goods" or into necessities" or "luxuries".

.4.1 Measurement of Income Elasticity

The basic formula for calculating the coefficient of income elasticity is:

$$\text{ncome Elasticity of Demand} = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in Income}}$$

$$E = \frac{\Delta Q/Q}{\Delta Y/Y} = \frac{\Delta Q}{Q} \times \frac{Y}{\Delta Y}$$

$$E = \frac{\Delta Q}{\Delta Y} \times \frac{Y}{Q}$$

Here E—Elasticity of demand, Q—Initial demand, ΔQ—Change in demand, Y—Initial ncome, ΔY—change in income)

For example, suppose the income of customer is ₹ 1000, and he purchase 20 litter milk. If the income increases to ₹ 1500, then he purchases 25 litter. Now the income elasticity of demand is calculated as:

Here $Q = 20$, $\Delta Q = 25 - 20 = 5$, $Y = 1000$, $\Delta Y = 1500 - 1000 = 500$

Then $$E = \frac{5/20}{500/1000} = \frac{5}{500} \times \frac{1000}{20} = 0.5$$ (It means less than unity)

5.4.2 Types of Income Elasticity of Demand

1. Positive Income Elasticity of Demand. Positive income elasticity of demand is that if increase of income of the customer causes increase in the quantity demanded of a commodity and decrease in the income of customer causes decrease in the demand of the commodity (*i.e.*, $E > 0$). If increase in the income of customer, his demand for a commodity is increase, and with decrease in income, his demand for a commodity decrease.

The following types of goods have positive elasticity of demand:

- *Normal goods.* They have a positive income elasticity of demand so as income rise more is demand at each price level. We make a distinction between normal necessities and normal luxuries (both have a positive coefficient of income elasticity).
- *Necessities.* They have an income elasticity of demand of between 0 and +1. Demand rises with income, but less than proportionately.

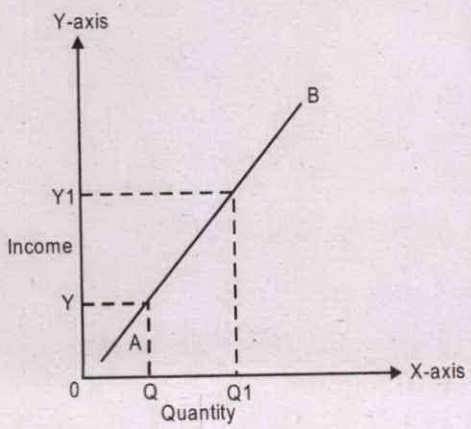

Figure 5.12

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Often this is because we have a limited need to consume additional quantities of necessa goods as our real living standards rise. The class examples of this would be the deman for fresh vegetables, toothpaste and newspapers. Demand is not very sensitive at all t fluctuations in income in this sense total market demand is relatively stable followin changes in the wider economic (business) cycle.

• *Luxuries.* They on the other hand are said to have an income elasticity of deman > + 1. (Demand rises more than proportionate to a change in income). Luxuries are item we can (and often do) manage to do without during periods of below average incom and falling consumer confidence. When incomes are rising strongly and consumers hav the confidence to go ahead with "big-ticket" items of spending, so the demand for luxur goods will grow. Conversely in a recession or economic slowdown, these items o discretionary spending might be the first victims of decisions by consumers to rein in thei spending and rebuild savings and household financial balance sheets.

2. Negative Income Elasticity of Demand. Income elasticity of demand is negative if increase in the income of customer, followed by fall in the demand of a commodity and with decrease in income, followed by rise in demand of a commodity (*i.e.*, $E < 0$).

The following types of goods have negative elasticity of demand:

• *Inferior Goods.* Inferior goods have a negative income elasticity of demand. Demand falls as income rises. In a recession the demand for inferior products might actually grow (depending on the severity of any change in income and also the absolute co-efficient of income elasticity of demand). For example, if we find that the income elasticity of demand for cigarettes is - 0.3, then a 5% fall in the average real incomes of consumers might lead to a 1.5% fall in the total demand for cigarettes (ceteris paribus).

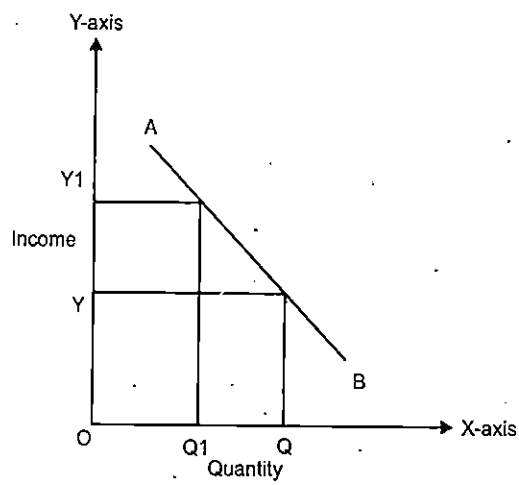

Figure 5.13

3. Zero Income Elasticity of Demand. Zero income elasticity (or inelastic) of demand occurs when an increase or decrease in income of customer is not associated with a change in the quantity demanded of a commodity.

In case of necessaries goods the elasticity of demand is zero. For example, salt, vegetables and LPG etc.

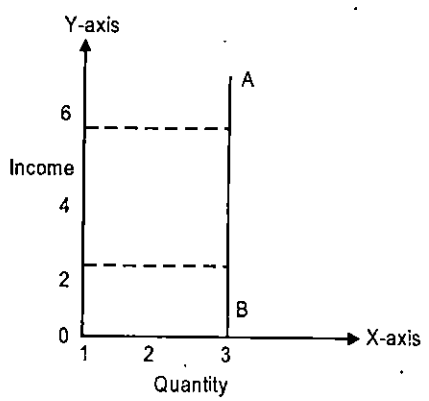

Figure 5.14

5.4.3 Degrees of Income Elasticity of Demand

There are three degrees of income elasticity of demand as given below:

Unity Income Elasticity of Demand. Income elasticity of demand is unity, when rcentage change in income causes equal percentage change in demand of a commodity e., E = 1).

Greater than Unity Income Elasticity. Greater than unity income elasticity of mand is that, when percentage change in income causes more percentage change in mand of a commodity (*i.e.*, E > 1).

Less than Unity Income Elasticity. Less than unity income elasticity of demand that, when percentage change in income causes less percentage change in demand of commodity (*i.e.*, E < 1).

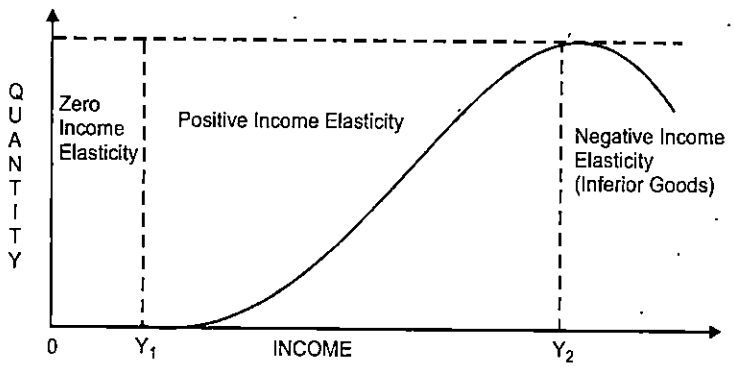

Figure 5.15

e income elasticity of demand for a product will also change over time—the vast jority of products have a finite life-cycle. Consumer perceptions of the value and sirability of a good or service will be influenced not just by their own experiences of nsuming it (and the feedback from other purchasers) but also the appearance of new oducts onto the market.

5 CROSS PRICE ELASTICITY OF DEMAND

e concept of cross elasticity was initially evolved by **Mr. Moore** in his famous book, nthetic Economics'. Later on, it was developed by **Sir Robert Tiffin** in his book, '*The eory of Value*'. The Cross Price Elasticity of Demand measures the rate of response quantity demanded of one commodity, due to change in price change of another mmodity. More specifically the cross elasticity of demand is percentage change in the mand for one good due to a percentage change in the price of another good.

oss price elasticity of demand refers to the percentage change in the quantity demanded a given product due to the percentage change in the price of another "related" oduct. If all prices are allowed to vary, the quantity demanded of product X is dependent only on its own price, but upon the prices of other products as well.

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me definitions of different economists related to Cross Price Elasticity of Demand en as under:

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Liebhafsky—*"The cross elasticity of demand is a measurement of the responsivenes of purchase of Y to change in the price of X."*

Prof. Ferguson—*"The cross elasticity of demand is the proportional change in th quantity demanded resulting from a given relative change in the price of the relativ good Y."*

R. G. Lipsey—*"Cross price elasticity of demand is the responsiveness of deman for good 'A' to changes in the price of good 'B'.*

5.5.1 Measurement of Cross Price Elasticity

The basic formula for calculating the coefficient of cross price elasticity of demand is

$$\text{Cross Price Elasticity of Demand} = \frac{\text{Percentage change in the demand of Good X}}{\text{Percentage change in the price of Good Y}}$$

$$E = \frac{\Delta Qx / Qx}{\Delta Py / Py}$$

$$E = \frac{\Delta Qx}{Qx} \times \frac{Py}{\Delta Py}$$

$$E = \frac{\Delta Qx}{\Delta Py} \times \frac{Py}{Qx}$$

(Here Qx—Original quantity of good X, Py—Original price of Y, ΔQx—Change quantity of good X, ΔPy—Change in price of good Y)

Prices of other goods affect the demand for a good in one of three ways. An increas in the price of another good causes an increase in demand, a decrease in demand, or n change in demand. The result is either, a substitute good, a complement good, or a independent good.

- **Substitute Good.** A substitute good exists if an increase in the price of or good causes an increase in demand for the other good. This is seen as a positiv value for the cross elasticity of demand, or a coefficient of elasticity of $E > 0$.
- **Complement Good.** A complement good exists if an increase in the price of o good causes a decrease in demand for the other good. This is seen as a negati value for the cross elasticity of demand, or a coefficient of elasticity of $E < 0$.
- **Independent Good.** An independent good exists if a change in the price of or good has no affect on the demand for another good. This is seen as a zero valu for the cross elasticity of demand, or a coefficient of elasticity of $E = 0$.

5.5.2 Types of Cross Elasticity of Demand

Cross elasticity of demand can be of three types:

1. Positive Cross Elasticity. With rise or fall in the price of commodity the quanti demanded of the related commodity increases or decreases accordingly, then the cro elasticity of demand is positive (*i.e.*, $E > 0$). Ordinarily, the cross elasticity of demand case of substitutes as tea and coffee, butter and jam, coca cola and campa cola etc. positive.

2. Negative Cross Elasticity of Demand. When with a rise in the price of a commodity, the demand for related good decreases, and with a fall in the price of a commodity, the demand for other related good increases, then the cross elasticity of demand is said to be negative (*i.e.*, $E < 0$). In case of complementary goods car and petrol, pen and ink, bread and butter etc., cross elasticity of demand is negative.

3. Zero Cross Elasticity of Demand. When with the change in the prices of a commodity there is no change in the demand of the other commodity, then the cross elasticity of demand is said to be zero (*i.e.*, $E = 0$). Generally, cross elasticity is zero when two goods are independent. Change in price of butter will have no effect on the demand of petrol. Hence, there cross elasticity is zero.

Table 5.5

Type of Goods	*Value of E*	*Type of Cross Elasticity of Demand*
Substitute good	$E > 0$	Positive
Complement good	$E < 0$	Negative
Independent good	$E = 0$	Zero

5.5.3 Difference between Cross Price Elasticity Demand and Income Elasticity Demand

The following are the important differences between cross price elasticity of demand and income elasticity of demand:

1. Cross price elasticity of demand measures how much demand of one good, say x changes when the price of another good, say y changes, holding everything else constant. For example, you can measure what happens to the demand of bread when the price of milk changes.
2. The cross price elasticity is calculated as the percentage change in the quantity demanded of good × divided by the percentage change in the price of good y.
3. If the cross price elasticity is negative, then we call such goods Complements (example: pizza and soft drinks—they are consumed together).
4. If the cross price elasticity is positive, then we call such goods Substitutes (example: pizza and burgers—you usually consume either one).
5. The income elasticity of demand measures the change in the quantity demanded of some good, when the income changes, holding everything else constant. For example, you can measure what happens to the demand for expensive red wine when income increases.
6. The income elasticity is calculated as the percentage change in the quantity demanded of the good divided by the percentage change in income.
7. If the income elasticity for a good is positive we call them normal goods. It can be between 0 and 1, and we call it income inelastic demand for goods such as food, clothing, and newspaper. If it is above 1, we call it income elastic demand. Examples are the red wine, cruises, jewelry, art, etc.

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8. If the income elasticity is negative, this means that as income increases, the quantity demanded for those goods actually decreases, we call those goods inferior goods. Examples are "Ramen noodles", cheap red wine, potatoes, rice. etc.

5.6 IMPORTANCE OF ELASTICITY FOR A BUSINESS

The following points show the importance of elasticity for a business:

1. If the business is producing on the price elastic section of the demand curve, a small percentage change in price leads to a large percentage change in quantity demanded. Lowering the price will have the effect of increasing total revenue and raising the price will decrease total revenue, *e.g.*, if the price of Mars Bars increased by 25% ceteris paribus, we would expect their sales to fall dramatically as consumers shift to other chocolate bars. This would have the effect of reducing their total revenue.
2. If the business is producing on the unitary price elasticity section of the demand curve, small changes in price do not change total revenue as a percentage change in price will be exactly offset by an inverse change in quantity.
3. If the business is producing on the price inelastic section of the demand curve, a small percentage change in price leads to a small percentage change in quantity demanded. This will have the effect of decreasing total revenue when the price is increased and increasing total revenue when the price falls. For example, if a firm invented a miracle cure for the common cold and decided upon a price of 50p a pack. The firm sold 10 million packs in the first year of sales. Next year they decide to raise prices by 25% and sales fall to 9 million (10% fall), the level of sales has dropped, but the total revenue has increased.

It is important to note that the revenue maximizing level of production occurs when elasticity is unitary, but this is not necessarily the level where profit is maximized. We do not know the firm's costs at different levels of output. Furthermore elasticity's are notoriously difficult to calculate and errors in the elasticity figures could lead to incorrect pricing decisions.

5.7 APPLICATIONS OF ELASTICITY OF DEMAND

One typical application of the concept of elasticity is to consider what happens to consumer demand for a good (for example, apples) when prices increase. As the price of a good rises, consumers will usually demand a lower quantity of that good, perhaps by consuming less, substituting other goods, and so on. The greater the extent to which demand falls as price rises, the greater the price elasticity of demand. However, there may be some goods that consumers require, cannot consume less of, and cannot find substitutes for even if prices rise (for example, certain prescription drugs). Another example is oil and its derivatives such as gasoline. For such goods, the price elasticity of demand might be considered inelastic.

Further, elasticity will normally be different in the short term and the long term. For example, for many goods the supply can be increased over time by locating alternative sources, investing in an expansion of production capacity, or developing competitive products which can substitute. One might therefore expect that the price elasticity of supply will be greater in the long term than the short term for such a good, that is, that supply can adjust to price changes to a greater degree over a longer time. This applies to the demand side as well. For example, if the price of petrol rises, consumers will find ways to conserve their use of the resource. However, some of these ways, like finding a more fuel-efficient car, take time. So consumers as well may be less able to adapt to price shocks in the short term than in the long term.

The concept of elasticity has an extraordinarily wide range of applications in economics. In particular, an understanding of elasticity is useful to understand the dynamic response of supply and demand in a market, in order to achieve an intended result or avoid unintended results. For example, a business considering a price increase might find that doing so lowers profits if demand is highly elastic, as sales would fall sharply. Similarly, a business considering a price cut might find that it does not increase sales, if demand for the product is price inelastic.

An example of how elasticity can be useful in business situations can be shown by the equation $MR = P * (1+E)/E$, where MR is marginal revenue, P is price of the good, and E is the own price elasticity of demand for the good. Notice that when E is less than negative one, demand is elastic. When E is between negative one and zero, demand is inelastic. And at $E=-1$, demand is unit elastic (or unitary elastic), and thus $MC=MB$ and $MNB=0$.

5.8 WHEN DOES RAISING YOUR PRICE BRING IN MORE MONEY?

For demand, there's a relationship between the elasticity and what happens to total revenue from customers when you change your price:

If demand is elastic	(if the elasticity is more negative than –1)	Then if the price goes up, the total amount customers spend goes down.
If demand is inelastic	(if the elasticity is between –1 and 0)	Then if the price goes up, the total amount customers spend goes up.
If you have unitary elasticity	(if the elasticity of demand is exactly –1)	Then if the price goes up,the total amount customers spend stays the same.

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5.9 SUMMARY

- Elasticity is the relative response of one variable to changes in another variable. Elasticity is commonly used in the study of market exchanges to identify the relative response of quantity to changes in price.
- The quantity demanded of a good is affected by changes in the price of the good, changes in prices of other goods, changes in income and changes in other relevant factors.
- Price elasticity of demand = $\frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$
- The Income elasticity of demand of a particular product depends not only on its own price and on the price of other related products, but also on other factors such as income.
- *"The cross elasticity of demand is a measurement of the responsiveness of purchase of Y to change in the price of X."*

5.10 REVIEW QUESTIONS

1. What is elasticity of demand? Explain various types of elasticity of demand.
2. Explain price elasticity of demand. Describe various methods of measurement of price elasticity of demand.
3. What do you understand by income elasticity of demand? Is it possible to measure income elasticity of demand?
4. What is elasticity of demand? Explain various degrees of price elasticity of demand.
5. Explain cross price elasticity of demand. Explain its methods of measurement.
6. What do you understand by elasticity of demand? Explain its various importance and applications.
7. What is cross price elasticity of demand? Explain difference between cross price elasticity of demand and income elasticity of demand.
8. Explain various methods of measurement of price elasticity of demand.

UNIT 6: SUPPLY

NOTES

STRUCTURE

6.1 MEANING OF SUPPLY

Supply is the amount of output available in the market *i.e.*, it is the willingness and ability of potential sellers to offer various specific amounts of a good or service for sale at each of a variety of alternative prices during a particular time period. Supply characteristics are related to the behaviour of firms in producing and selling a product or service. In other words supply refers to the quantity of a commodity which a seller is produced to sell at a given price and at a given period of time. Thus, supply of a commodity is a flow concept as it refers to the quantity of a commodity that would be offered for sale at all the possible prices during any period of time. In the general way, the term supply and stock are used in the same sense. In economics supply should be distinguished from stock. Stock is the total amount of a commodity which available at a particular moment of time and can be brought into the market for sale at a short notice and supply means the quantity which is actually brought in the market at a given price during a period of time.

6.1.1 Aspects of Supply

Some aspects of supply are given as under:

1. Willingness and Ability. Supply requires both willingness and ability. While supply can be constrained by the physical ability to sell a good, production cost is often the primary influence on ability. A seller must receive enough revenue to compensate for the cost of production, or there is no supply.

2. Range of Prices and Quantities. Supply is a range of prices and quantities. It includes not just the quantity sold at the current price, but any and all quantities that would be sold at other prices—higher and lower.

3. Time Period. Supply is identified for a specified time period. The analysis of asparagus supply needs information on the time period. Is the supply for an hour, a day, a week,

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a month, a year, or a decade? Presumably, people sell a larger quantity of asparagus, at a given price, over a decade than over a week. When economists work with supply they need a specific time period.

Definitions

Some definitions of different economists related to Supply given as under:

Samuelson—*"Supply refers to the amount of a good that producers in a given market desire to sell, during a given time period at various prices, ceteris paribus."*

Thomas—*"The supply of goods is the quantity offered for sale in a given market at a given time at various prices."*

Murad—*"Quantity supplied refers to the quantity of commodity offered for sale at a given price in a given market at a given time."*

6.2 LAW OF SUPPLY

The law of supply can be approached from two different contexts. The first is that it represents the sum total of production plus carryover stocks. The other context for supply describes the behaviour of producers. The market or total supply represents the quantities producers are willing to sell over a range of prices for any given time period. At the individual level, you may be willing to produce a given product as long as the market price is equal to or greater than the cost of producing that product. The total supply is the sum of the individual quantities of product that each farmer brings to the market.

The law of supply is the direct relationship between the price of the commodity and its quantity supplied, assuming ceteris paribus factors are held constant. This economic principle indicates that an increase in the price of a commodity, supply of that commodity extends and when price decreases, supply contracts, other factors are held constant. In other words there is positive relation between the price and the quantity supplied.

Definitions

Some definitions of different economists related to Law of Supply given as under:

Lipsey—*"The law of supply states that other things being equal, the quantity of any commodity that firms will produce and offer for sale is positively related to the commodity's own price, rising when price rises and fall when price falls."*

Dooley—*"The law of supply states that other things being equal the higher the price, the greater the quantity supplied or the lower the price, the smaller the quantity supplied."*

Assumptions

The law of supply holds well when "other things remain the same." It means factors influencing supply, other than price, are assumed to be constant. In a functional form this can be stated as:

$$Q_s = f(P)\ [T, I, E, Pr]_{const.}$$

(Here, Qs—Quantity supplied of the commodity, P—Price of commodity, T—Technical conditions or methods of production, I—Income of customers, E—Expectations of the customers, Pr—Price of raw material.)

Assumptions of the law of supply are that all the determinants of supply other than the price of the commodity (P) remain constant as given below:

1. There should be no change in the income of the customers.
2. There should be no change in the price of raw material.
3. There should be no change in the technical conditions or methods of production.
4. Customer does not expect any change in the price of the commodity in near future.

Thus, the quantity of a commodity supplied is a function of its own price. There exists a direct relationship between the quantity supplied and the price of a commodity. It is subject to the condition that other things should remain constant. In this case 'other things' include mainly two things. These are technical conditions or methods of production (T) and the prices and quantities of the resources supplied (Pr). With improved technical conditions, supply can be increased at the same old price, since the cost of production can now be reduced. Similarly with an enhanced supply of resources and a reduction in the prices of resources such as land, labour, and raw materials etc. an increasing quantity of the commodity can be supplied at a constant or even falling price.

6.2.1 Explanation of the Law

According to the law of supply there should be positive relationship between price of the commodity and quantity supplied. However, this relationship is not proportionate, meaning there by that it is not necessary that supply should be half if the price half. The law of supply indicates the direction of change in supply as a result of change in the price. The law of supply explained with the help of supply schedule and supply curve.

Supply Schedule

Supply schedule is a table that illustrates the alternative quantities of a commodity supplied at different prices. A supply schedule is a simple means of summarizing information about supply price and quantity supplied for a particular good. Like demand schedule supply schedule is also of two type: (1) Individual Supply Schedule (2) Market Supply Schedule.

1. Individual Supply Schedule. Individual supply schedule is a table that illustrates the alternative quantities of a commodity supplied by an individual supplier at different prices at a given time period.

Table 6.1 **Individual Supply Schedule**

Price of Commodity (₹)	*Quantity Supplied*
1	0
2	2
3	4
4	6

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The above table 6.1 shows the individual supply schedule. It indicates the quantity of commodity that supplied by a single supplier at different prices at a given time period. It is evident from the above schedule that as the price increase its supply expands. When price of commodity is ₹ 2.00 quantity supplied is 2 units only and when price goes up to ₹ 4.00 the quantity supplied expands to 6 units.

2. Market Supply Schedule. Market supply schedule is a table that illustrate the total quantity of a commodity supplied by all suppliers at different prices at a given time period.

Table 6.2 **Market Supply Schedule**

Price of Commodity 'A'	*Supply by Supplier 'X'*	*Supply by Supplier 'Y'*	*Market Supply*
1	0	0	0
2	2	3	2 + 3 = 5
3	4	5	4 + 5 = 9
4	6	7	6 + 7 = 13

The above table 6.2 represents market supply schedule. The schedule is based on the supposition that there are only two suppliers 'X' and 'Y' of a commodity 'A'. It specifies that when price of commodity 'A' is ₹ 2.00, the supplier 'X' supplies 2 units and 'Y' supplies 3 units of commodity 'A'. Therefore, the market supply is 2 + 3 = 5 units. As the price increase the supply also increases.

6.2.2 Supply Curve

A graphical representation of the relation between the supply price and quantity supplied, holding all ceteris paribus supply determinants constant. Its slopes generally upwards, indicating that supply will increase at higher price. A supply curve is a simple means of summarizing information about supply price and quantity supplied for a particular good in a graph. Like supply schedule supply curve is also of two type like (1) Individual Supply Curve (2) Market Supply Curve.

1. Individual Supply Curve. Individual supply curve is a curve that shows different quantity of commodity supplied by an individual supplier at different prices. The figure given 6.1, shows the individual supply curve. On X-axis is shown the quantity supplied and on Y-axis, the price. SS is the supply curve. Each point on the supply curve expresses the relation between the price and supply. At the price of ₹ 1.00 the supply is zero units and on the price ₹ 2.00 the supply of 2 units as

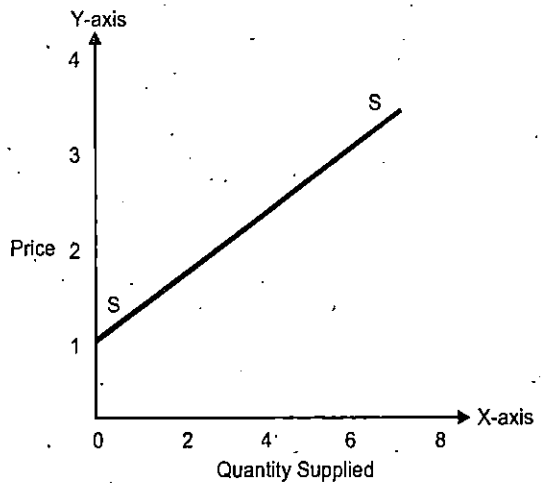

Figure 6.1

the price increase to ₹ 4.00 the supply also increase to 6 units. The slope of individual supply curve is positive it means that as price increases the quantity supplied also increases.

2. Market Supply Curve. The Market supply curve is a curve that represents the aggregate supply of all the suppliers in the market at different prices of a particular commodity. The figure given below shows the market supply curve. On X-axis is shown the quantity supplied and on Y-axis, the price.

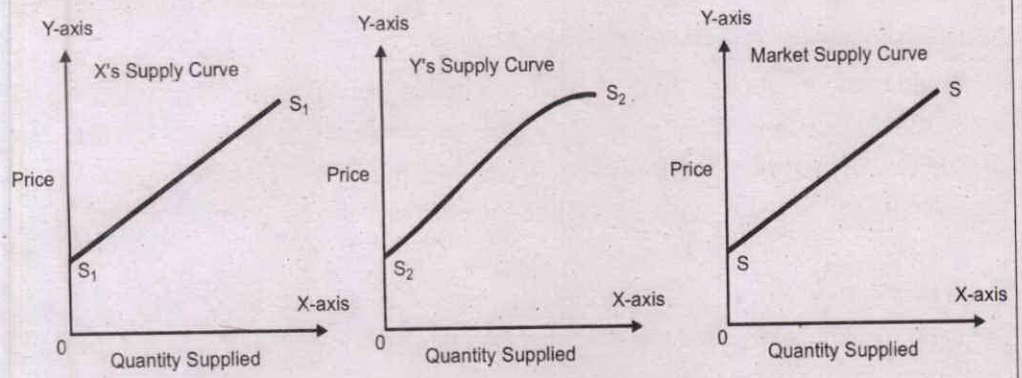

Figure 6.2

In figure 6.2, quantity supplied is shown OX-axis and price on Y-axis. First figure is supply curve of 'X' second figure is supply curve of 'Y' and the final figure is Market supply curve. When price is ₹ 2.00 per unit, 'X' supplied 2 units and 'Y' supplied 3 units. If they are the only supplier in the market, then the market supply will be 2 + 3 = 5 units. Like individual supply curve the slope of market supply curve is also positive.

6.3 DETERMINANTS OF SUPPLY OR SUPPLY FUNCTION

Determinants of supply are the factors that affect supply, but which are assumed constant when a supply curve is constructed. The supply of a particular commodity at any given time is determined by the following factors:

1. Price of Resources (Pr)
2. Production Technology (T)
3. Products on Prices (P)
4. Other Prices (Po)
5. Sellers' Expectations (E)
6. Number of Sellers (N) .

The supply function explains the functional relationship between quantity supplied of a commodity and its various determinants. The supply function of the above given factors expressed as:

$$Q_s = f [Pr, T, P, Po, E, N]_{const.}$$

NOTES

(Here Qs—Quantity supplied of the commodity, Pr—Price of Resources, T—Production Technology, P—Products on price, Po—Other Prices, E—Seller's expectations, N—Number of sellers). These determinants of supply for a commodity are explained as under:

1. Price of Resources. The prices paid for the use of labour, capital, land, and entrepreneurship affect production cost and the ability to supply a good. If resource prices increase, then production cost is higher and the sellers are inclined to offer less of the good for sale. If resource prices decrease, then production cost is lower and the sellers are inclined to offer more of the good for sale.

2. Production Technology. The information available relating to production techniques affects the ability to supply a good. Technology is what producers know about the ways to combine inputs into the production of outputs. An advance in technology makes it possible to sell more of a good. A decline in technology means producers can sell less of a good.

3. Products own Price. If the price of a product increases and the prices of all other products remain same, production of that product becomes cost-effective. Accessible firms are, like to expand their production and the new firms try to making their presence in that industry. Thus, supply expands when price rises and constructs when price falls.

4. Other Prices. The supply for one good is based on the prices paid for other goods that use the same resources for production. A change in the price of a substitute good (or substitute-in-production) induces sellers to alter the mix of goods purchased. An increase in the price of a substitute motivates sellers to sell more of this good and less of the substitute good. A change in the price of a complement good (or complement-in-production) induces sellers to supply more or less of both goods. An increase in the price of a complement motivates sellers to sell more of this good as they sell more of the complement good.

5. Sellers' Expectations. The decision to sell a good today depends on expectations of future prices. Sellers seek to sell the good at the highest possible price. If sellers expect the price to decline in the future, they are inclined to sell more now. If they expect the price to rise in the future, they are inclined to sell less now.

6. Number of Sellers. The number of sellers willing and able to sell a good affects the overall supply. With more sellers, there is more supply. With fewer sellers, there is less supply.

6.4 INCREASE IN SUPPLY AND DECREASE IN SUPPLY OR SHIFT IN SUPPLY CURVE

When the change in supply of a commodity takes place because of change in factors other than its price, like change in the production technology, price of raw material (determinants of supply) then this is called shifting of supply curve or increase and decrease in supply.

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6.4.1 Increase in Supply

Increase in supply means increase in the willingness and ability of sellers to sell a good at the existing price, illustrated by a rightward shift of the supply curve. An increase in supply is caused by a change in a supply determinant and results in an increase in equilibrium quantity and a decrease in equilibrium price.

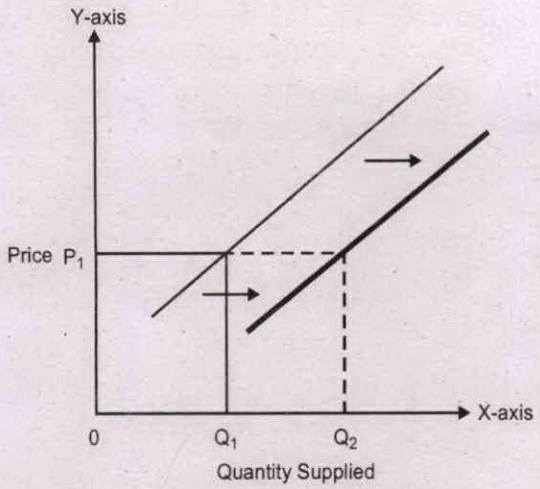

Figure 6.3 Increase in Supply

First, consider the simple comparative static analysis of the supply increase. The figure 6.3, presents the market for Ice Cream. The equilibrium price is P_1 and the equilibrium quantity is Q_1. This market equilibrium will, of course, persist until and unless a determinant changes, which is the nature of equilibrium. The particular change under scrutiny is an increase in supply caused by a change in any of the supply determinants. Under the influence of change in factors other than the price, supply curve will shift downwards to right. The new supply curve shows that supply increases from Q_1 to Q_2. The new supply curve represents the increase in supply.

6.4.2 Decrease in Supply

Decrease in supply means decrease in the willingness and ability of sellers to sell a good at the existing price, illustrated by a leftward shift of the supply curve. A decrease in supply is caused by a change in a supply determinant and results in a decrease in equilibrium quantity and an increase in equilibrium price.

First, consider the simple comparative static analysis of the supply decrease. The figure 6.4, presents market of Ice Cream. The equilibrium price is P_1 and

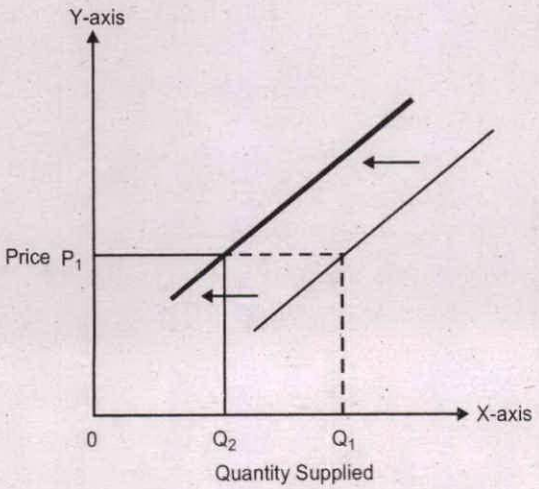

Figure 6.4 Decrease in Supply

the equilibrium quantity is Q_1. This market equilibrium will, of course, persist until and unless a determinant changes, which is the nature of equilibrium. The particular change under scrutiny is a decrease in supply caused by a change in any of the supply determinants. When due to change in other factor than the price supply decreases, the new supply curve shifts up-wards to the left. The new supply curve shows that supply decreases from Q_2 to Q_1. The new supply curve represents the decrease in supply.

6.5 ELASTICITY OF SUPPLY

The general supply relation in which relatively small changes in price cause relatively large changes in quantity supplied. Small changes in price cause relatively large changes in quantity supplied or the percentage change in quantity supplied is larger than the percentage change in price. This characterization of elasticity is most important for the price elasticity of supply.

6.5.1 Price Elasticity of Supply

The price elasticity of supply is the relative response of a change in quantity supplied to a change in price. More specifically the price elasticity of supply is the percentage change in quantity supplied due to a percentage change in price. The price elasticity of supply is often summarized by this formula:

$$\text{Price elasticity of supply} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

According to the law of supply, higher supply prices are related to larger quantities supplied. As such, the numerator and denominator of this formula always have the same signs—if one is positive, the other is also positive. If the supply price increases and the percentage change in price are positive, then the quantity supplied increases and the percentage change in quantity supplied is also positive. When calculated, the price elasticity of supply, therefore, is always positive.

6.5.2 Degrees of Price Elasticity of Supply

The price elasticity of supply is fall in the following categories of supply:

1. Perfectly Elastic. Perfectly elastic means an infinitesimally small change in price results in an infinitely large change in quantity supplied. This elasticity alternative exists when the price is fixed, that is, an infinite range of quantities is associated with the same price. This is the extreme, limiting case of elastic. Perfectly elastic supply can occur, in theory, when producers are able to switch resources among a large number of perfect substitutes-in-production.

2. Relatively Elastic. Relatively elastic means that relatively small changes in price cause relatively large changes in quantity. Quantity is very responsive to price, but not infinitely so. The percentage change in quantity supplied is greater than the percentage change in price. Relatively elastic supply occurs when producers are able to switch resources among a large number of close but not perfect substitutes-in-production.

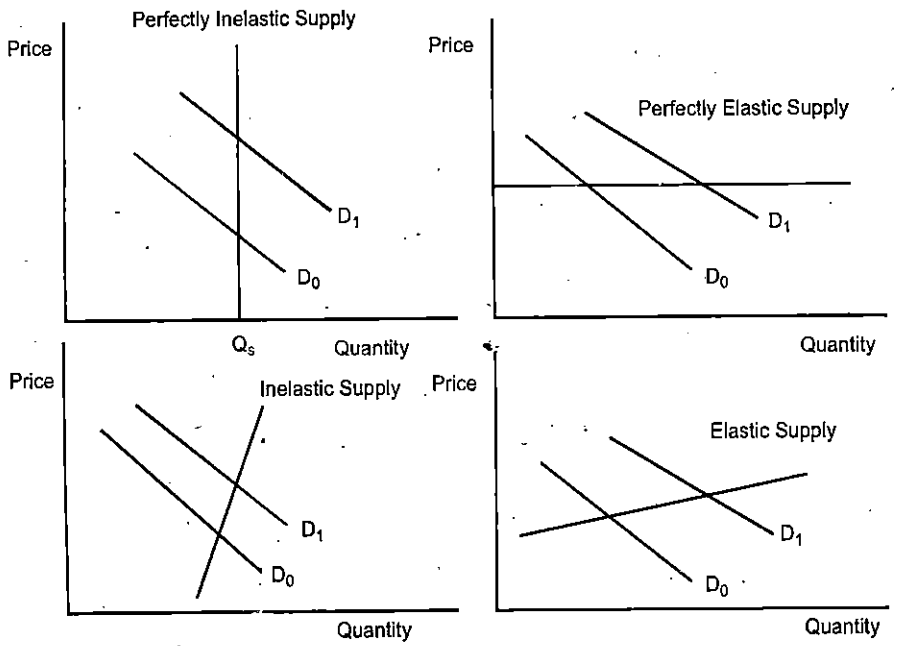

Figure 6.5 Illustrating Price Elasticity of Supply

3. Unit Elastic. The third category is unit elastic, in which the coefficient of elasticity is E = 1. In this case, any change in price is matched by an equal relative change in quantity. The percentage change in quantity is equal to the percentage change in price. For example, a 10 percent change in price induces a equal 10 percent change in quantity supplied. Unit elastic is essentially a dividing line or boundary between the elastic and inelastic ranges.

4. Relatively Inelastic. The fourth category is relatively inelastic, in which the coefficient of elasticity falls in the range $0 < E < 1$. With relatively inelastic supply, relatively large changes in price cause relatively small changes in quantity. Quantity is not very responsive to price. The percentage change in quantity is less than the percentage change in price. In this case, a 10 percent change in price induces less than a 10 percent change in quantity supplied (perhaps only 5 percent).

5. Perfectly Inelastic. The final category presented in this chart is perfectly inelastic, given by E = 0. Perfectly inelastic means that quantity supplied is unaffected by any change in price. In other words, the quantity is essentially fixed. It does not matter how much price changes, quantity does not budge.

When supply is perfectly inelastic, a shift in the demand curve has no effect on the equilibrium quantity supplied onto the market. Examples include the supply of tickets for sports or musical venues, and the short run supply of agricultural products (where the yield is fixed at harvest time) the elasticity of supply = zero when the supply curve is vertical.

When supply is perfectly elastic a firm can supply any amount at the same price. This occurs when the firm can supply at a constant cost per unit and has no capacity limits to its production. A change in demand alters the equilibrium quantity but not the market clearing price.

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When supply is relatively inelastic a change in demand affects the price more than the quantity supplied. The reverse is the case when supply is relatively elastic. A change in demand can be met without a change in market price.

6.5.3 Measuring Elasticity of Supply

The important question is now that how elasticity of supply can be measured at a point on a given supply curve. Consider a linear supply curve SS as drawn in figure 6.6. Where we are required to measure the elasticity of supply at the point A on this supply curve, corresponding to quantity supplied Q and price P. In order to measure the supply elasticity at point A we extend the supply curve so that it meets the X-axis at point R. The elasticity of supply can be calculated by dividing the distance RQ by the distance OQ.

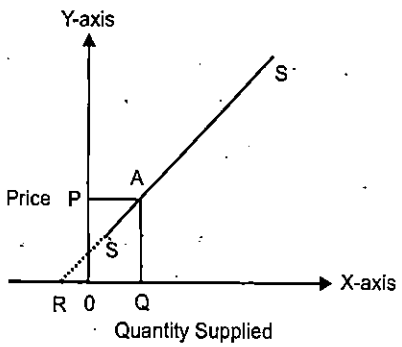

Figure 6.6

Supply elasticity at point A on the supply curve = RQ/OQ

Proof

$$\text{Price elasticity of supply (E)} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

$$E = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

The $\Delta Q/\Delta P$ is the elasticity formula, is the reciprocal of the slope of the supply curve ($\Delta Q/\Delta P$ = 1/slope)

$$E = \frac{1}{\text{Slope}} \times \frac{P}{Q} \qquad ...(1)$$

Slope of the supply curve SS is equal to the AQ/RQ

At point A price (P) is AQ and quantity supplied (Q) is equal to OQ. Substituting these values in the equation (1) for the coefficient of supply elasticity:

$$E = \frac{1}{AQ/RQ} \times \frac{AQ}{OQ}$$

$$E = \frac{RQ}{AQ} \times \frac{AQ}{OQ}$$

$$E = RQ/OQ$$

Hence, elasticity of supply is the ratio of distance RQ and OQ.

6.5.4 Determinants of Elasticity of Supply

The value of price elasticity of supply is positive, because an increase in price is likely to increase the quantity supplied to the market and vice versa. The elasticity of supply depends on the following factors:

1. Spare Capacity. How much spare capacity a firm has—if there is plenty of spare capacity, the firm should be able to increase output quite quickly without a rise in costs and therefore supply will be elastic.

2. Stocks. The level of stocks or inventories—if stocks of raw materials, components and finished products are high then the firm is able to respond to a change in demand quickly by supplying these stocks onto the market—supply will be elastic.

3. Ease of Factor Substitution. Consider the sudden and dramatic increase in demand for petrol canisters during the recent fuel shortage. Could manufacturers of cool-boxes or producers of other types of canister have switched their production processes quickly and easily to meet the high demand for fuel containers?

If capital and labour resources are occupationally mobile then the elasticity of supply for a product is likely to be higher than if capital equipment and labour cannot easily be switched and the production process is fairly inflexible in response to changes in the pattern of demand for goods and services.

4. Time Period. Supply is likely to be more elastic, the longer the time period a firm has to adjust its production. In the short run, the firm may not be able to change its factor inputs. In some agricultural industries the supply is fixed and determined by planting decisions made months before, and climatic conditions, which affect the production, yield.

6.6 APPLICATIONS OF PRICE ELASTICITY OF DEMAND AND SUPPLY

Elasticity of demand and supply is tested in virtually every area of the AS economics syllabus. The key is to understand the various factors that determine the responsiveness of consumers and producers to changes in price. The elasticity will affect the ways in which price and output will change in a market. And elasticity is also significant in determining some of the effects of changes in government policy when the state chooses to intervene in the price mechanism.

Some relevant issues that directly use elasticity of demand and supply include:

1. Taxation. The effects of indirect taxes and subsidies on the level of demand and output in a market *e.g.* the effectiveness of the congestion charge in reducing road congestion; or the impact of higher duties on cigarettes on the demand for tobacco and associated externality effects.

2. Changes in the exchange rate. The impact of changes in the exchange rate on the demand for exports and imports.

3. Exploiting monopoly power in a market. The extent to which a firm or firms with monopoly power can raise prices in markets to extract consumer surplus and turn it into extra profit (producer surplus).

4. Government intervention in the market. The effects of the government introducing a minimum price (price floor) or maximum price (price ceiling) into a market.

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Elasticity of demand and supply also affects the operation of the price mechanism as a means of rationing scarce goods and services among competing uses and in determining how producers respond to the incentive of a higher market price.

6.7 SUMMARY

- Supply is the amount of output available in the market *i.e.*, it is the willingness and ability of potential sellers to offer various specific amounts of a good or service for sale at each of a variety of alternative prices during a particular time period.
- *"The law of supply states that other things being equal, the quantity of any commodity that firms will produce and offer for sale is positively related to the commodity's own price, rising when price rises and fall when price falls."*
- According to the law of supply there should be positive relationship between price of the commodity and quantity supplied.
- A supply curve is a simple means of summarizing information about supply price and quantity supplied for a particular good in a graph.
- Increase in supply means increase in the willingness and ability of sellers to sell a good at the existing price, illustrated by a rightward shift of the supply curve.
- Decrease in supply means decrease in the willingness and ability of sellers to sell a good at the existing price, illustrated by a leftward shift of the supply curve.
- The price elasticity of supply is the relative response of a change in quantity supplied to a change in price.
- Price elasticity of supply = $\frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$

6.8 REVIEW QUESTIONS

1. What do you understand by supply? Also explain the law of supply.
2. Define supply and explain the determinants of supply.
3. Explain the following terms in brief:
   (*a*) Supply
   (*b*) Supply schedule
   (*c*) Supply curve
   (*d*) Determinants of supply.
4. Explain increase and decrease in supply with suitable diagram.
5. Explain the law of supply with the help of supply schedule and supply curve.
6. Define elasticity of supply. Explain its various types.
7. Is it possible to measure elasticity of supply? If yes, then how?

UNIT 7: CONCEPTS OF COSTS

NOTES

STRUCTURE

7.1 INTRODUCTION

Monetary values of goods and services that producers and consumers purchase. In a basic economic sense, cost is the measure of the alternative opportunities forgone in the choice of one good or activity over others. For consumers, cost describes the price paid for goods and services. For producers, cost has to do with the relationship between the value of production inputs and the level of output.

In the common sense, the measure of the value of what has to be given up in order to achieve a particular objective. In everyday language, people most often use the term rather like an accountant does, as synonymous with the total money outlays actually paid out to achieve the objective, but this is not precisely what economists mean by the term. Economists are concerned with rational decision-making, and the rational decision-maker needs to estimate in advance the full range of consequences of each of the various alternative uses of his time and resources open to him, not just the portion of the costs accounted for by money outlays. For the economist, the true cost of any decision is the value of the next best outcome (of all the other possible outcomes) that is given up because of that decision. There are a number of concepts of cost like real cost, money cost, social cost, opportunity cost etc.

Definition

Definition of different economist related to Cost given as under:

John Ruskin—*"A thing is worth what it can do for you, not what you choose to pay for it."*

Proverb—*"Something you don't want is valued at any price."*

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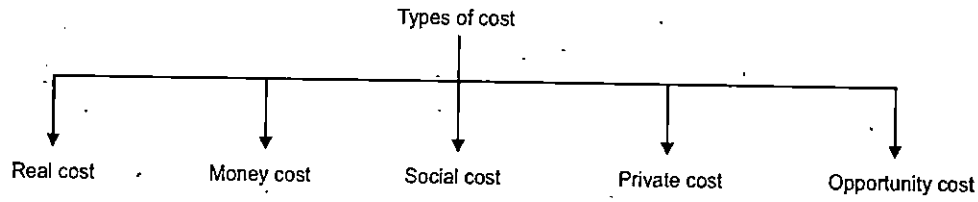
7.2 CONCEPTS OF COST

In economics there are various concepts of cost. The important concepts of cost are given below:



7.2.1 Real Cost

Real cost means the efforts, exertions, sacrifices, waiting etc. which the various members of society have to undergo to produce a commodity. From the point of view of economy as whole, it is the real cost which is more important but it cannot be measured. The real cost is computed in terms of the pain and the discomfort involved for labour when it is engaged in production and also the abstinence and sacrifice involved in saving and capital accumulation.

Definition

Definition of different economist related to Real Cost given as under:

Marshall—*"The exertion of all the different kinds of labour that are directly or indirectly involved in making it (commodity) together with the abstinences or rather the waiting's required for saving the capital used in making it, will be called the real cost of production of commodity."*

The real cost is not measured in terms of money but also in terms of efforts, exertions, sacrifices and waiting feel in production of goods and services.

7.2.2 Money Cost

The money cost of a certain quantity of commodity can be calculated by adding the market price paid to the factors of production employed in the production of that amount of the commodity. In other words the amount spends in terms of to produce a commodity is called its money cost. For example, the cost of producing 100 mobile phones is ₹ 20,000 then it will be money cost of producing 100 mobile phones.

Definition

Definition of different economist related to Money Cost given as under:

J.L. Hanson—*"The money cost of producing a certain output of commodity is the sum of all the payments to the factors of production engaged in the production of that commodity and for non-factor resources."*

The money cost includes the following:

1. Price of all kinds of raw material
2. The wages and salary paid to the workers
3. Interest on capital, rent and other trade expenses
4. Normal profit of the enterprise

The concept of money cost is very important because money cost of production is determined the output of the firm or industry.

7.2.3 Social Cost

Social cost includes all the costs of production of the output of a particular goods or service. In other words social cost is the cost of production of a commodity which includes the direct and indirect cost which the society pay for the production of the commodity, for example, from pollution of the atmosphere. Social costs are the sum of private costs and external costs.

Social Cost = Private Cost + External Cost

For example, the purchase price of a car reflects the private cost experienced by the manufacturer. The air pollution created in the production of the car however, is an external cost. Because the manufacturer does not pay for these costs, and does not include them in the price of the car, they are said to be external to the market pricing mechanism. The air pollution from driving the car is also an externality. The driver does not pay for the environmental damage caused by using the car.

Another example of higher social costs comes from the problems caused by traffic congestion in towns, cities and on major roads and motor ways.

7.2.4 Private Cost

Private cost is the cost that the buyer of a goods or service pays the seller. In other words, a cost incurred in the production process by the producer; including tax and profit margins that are estimated.

Definition

Some definitions of different economist related to Private Cost given as under:

Miller—*"Private costs are costs incurred by the firm or the individuals producers as a result of their own decisions."*

Private costs for a producer of a goods, service, or activity include the costs the firm pays to purchase capital equipment, hire labour, and buy materials or other inputs. For example, the private costs of driving a car include the fuel and oil, maintenance, depreciation, and even the drive time experienced by the operator of the car. Private costs are paid by the firm or consumer and must be included in production and consumption decisions. In a competitive market, considering only the private costs will lead to a socially efficient rate of output only if there are no external costs.

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There is a difference between private cost and social cost is that, private cost is the cost of production that is actually measured by the free market and social cost is the "true" cost of production.

7.2.5 Opportunity Cost

Opportunity cost is a one of the most fundamental concepts used in the study of economics. An opportunity cost can be either explicit, usually involving a monetary payment, or implicit, which does not involve a transaction. Opportunity cost is also commonly termed economic cost. When economists refer to the "opportunity cost" of a resource, they mean the value of the next-highest-valued alternative use of that resource. For example, you spend time and money going to a movie, you cannot spend that time at home reading a book, and you can't spend the money on something else. If your next-best alternative to seeing the movie is reading the book, then the opportunity cost of seeing the movie is the money spent plus the pleasure you forgo by not reading the book. Opportunity cost is the cost of next best alternative so it is also called alternative cost.

Definitions

Some definitions of differents economist related to Opportunity Cost given as under:

Ferguson—*"The alternative or opportunity cost of producing one unit of commodity X is the amount of commodity Y that must be sacrificed in order to use resources to produced X rather than Y."*

David R. Henderson—*"The word opportunity in opportunity cost is actually unnecessary. The cost of using something is already the value of the highest-valued alternative use. But as contract lawyers and airplane pilots know, redundancy can be a virtue. In this case, its virtue is to remind us that the cost of using a resource arises from the value of what it could be used for instead."*

Leftwich—*"Opportunity cost of a particular product is the value of the foregone alternative product that resources used in its production could have produced."*

The two points are noted from the above definitions of opportunity cost. First, the opportunity cost of anything is only the next best alternative foregone. It means that the opportunity cost of producing a goods is not any other alternative goods that could be produced with the same factors; it is only the most valuable other goods which the same factors could produce. Second point worth noting in the above definition is the addition of the qualification or group of factors costing the same amount of money. The need for the addition of this qualification arises because all the factors used in the production of one goods may not be the same as are required for the production of the next best alternative goods.

7.2.6 Explicit Cost

Explicit cost is that cost which involves a monetary payment or some other form of reward. The monetary payment is generally made to compensate the person who initially foregoes the satisfaction. This payment, in effect, transfers the burden of the opportunity cost from the original person to the one making payment.

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Definition

Definition of different economist related to Explicit Cost given as under:

Leftwich—*"Explicit costs are those cash payments which firms makes to outsiders for their services and goods.*

Examples of explicit costs would be items such as wage expense, rent or lease costs, and the cost of materials that go into the production of goods. With these expenses, it is easy to see the source of the cash outflow and the business activities to which the expense is attributed.

7.2.7 Implicit Cost

Implicit cost is that cost which does not involve a monetary payment or any other form of compensation. The monetary payment that is often made to compensate the person who initially foregoes the satisfaction is not made for implicit cost. There is no payment to transfer the burden of the opportunity cost from the original person to someone else. Implicit cost is also occasionally termed implicit opportunity cost.

Definition

Definition of different economist related to Implicit Cost given as under:

Leftwich—*"Implicit costs are costs of self owned or self employed resources."*

These are intangible costs that are not easily accounted. For example, the time and effort that owner puts into the maintenance of the company rather than working on expansion.

7.2.8 Sunk Cost

In economics sunk costs are the costs that have already been incurred and which cannot be recovered to any significant degree.

For example, when a car is purchased, it can subsequently be resold; however, it will certainly not be resold for the original purchase price. The economic loss is the difference (including transaction costs). The sum originally paid should not affect any rational future decision-making about the car, regardless of the resale value—if the owner can derive more value from selling the car than not selling it, it should be sold, regardless of the price paid. In this sense, the sunk cost is not a precise quantity, but an economic term for a sum paid, in the past, which should no longer be relevant; it may be used inconsistently in quantitative terms as the original cost or the expected economic loss. It may also be used as shorthand for an error in analysis due to the sunk cost fallacy, non-rational decision-making or, most simply, as irrelevant data.

7.3 COST FUNCTIONS

The cost function is a function of input prices and output quantity. Its value is the cost of making that output given those input prices. The production costs are changed with the time period; due to change in the cost of production economists find difference between the short-run cost and long-run cost. The short-run costs are that costs which

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are incurred by the firm during a period in which some factors like land, management and capital equipment held constant. The short-run costs are depends on the purchase of raw material, fuel, power etc. which vary with change in output. The long-run costs are the costs incurred during a period which is sufficiently large and allow the variation in all the factors of production including land, capital equipments and management for production of goods and services. Cost function can be written as

$$C = f(P, T, K, Fp)$$

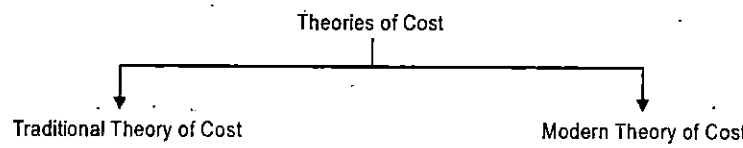
(Here C—cost of production, P—level of production, T—technique of production, K—capital, Fp—price of factor of production)

In the short-run cost function the technology, factor price, capital equipments, land etc. remain fixed.

In the long-run cost function the technology, factor price, land etc. remain fixed.

7.4 THEORIES OF COSTS

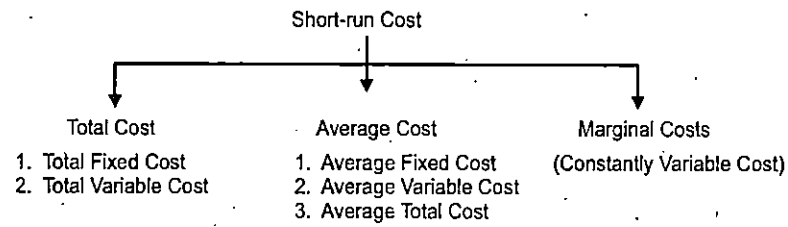
The theories of cost are divided into two types *i.e.*, traditional theory of cost and modern theory of cost:



The traditional theory of cost refers to the popular traditional belief of businesses that cost affects the quantity of output. In this theory the average cost and marginal cost are "U" shaped. On the other hand the modern theory states that the cost affects the quality of the output produced rather than quantity. In this theory average cost and marginal cost are of "L" shape. This belief signifies the change in the business outlook. As customer satisfaction is the prime motive of businesses today. On the basis of time period costs are studied in two parts *i.e.*, (1) Short-run cost and (2) Long-run cost.

7.4.1 Short-run Cost

In Economics or managerial economics, the short-run is the decision-making period during which at least one input is considered fixed and others are variable. The short-run costs are directly related to short-run productivity. Like fixed and variable inputs, there are fixed and variable costs. In the short-run there are total, average and marginal procedures of productivity, there are also total, average and marginal procedures of costs. The short-run cost may be of three types as given below:



NOTES

1. Total Cost

The total cost is the cost of the factors of production used by a firm to produce a good or service including wages paid to labour, rent paid for the land, interest paid to capital owners, and a normal profit paid to entrepreneurs. In the short-run these factors of production are divided into two categories fixed and variable. Total cost of production also divided in the similar manner. The cost of the fixed factors is called total fixed cost and the cost of variable factors is called total variable cost. Total cost is most important in the analysis a firm's short-run production decision.

For example, total manufacturing costs are the sum of direct materials, direct labour, and factory overhead. By management function, the total costs of a manufacturing business are the sum of manufacturing costs and selling and administrative expenses.

It means that total cost is the sum of the total fixed cost and total variable cost.

$$TC = TFC + TVC$$

(Here TC—total cost, TFC—total fixed cost, TVC—total variable cost)

The total cost varies with the change in the output because of one component, *i.e.*, variable cost. The total cost of production will also change with the change in the level of output. The total cost increase as the level of output increase.

Definition

Definition of different economist related to Total Cost given as under:

Browning—*"Total cost (TC) is the sum of total fixed cost and total variable cost for each output level."*

Total cost is the overall cost or the addition of all costs incurred in production or investment (TFC + TVC). Even if the quantity of output is zero (Q = 0), total cost could be greater than zero because of fixed costs.

1.1 Total Fixed Cost

Fixed costs are those which are independent of output, it means which do not change with change in output. These costs are a fixed amount which must be incurred by a firm in the short-run, whether the output is small or large. Even if the firm temporarily shuts down, it still continues to incur the fixed cost expense. Fixed costs are also known as overhead cost and include charges such as contractual rent, insurance charges, maintenance cost, interest on capital etc. Thus the fixed costs are those which are incurred in hiring the fixed factors of production whose amount cannot be changed in the short-run.

Definition

Definition of different economist related to Total Fixed Cost given as under:

Ferguson—*"Total fixed cost is the sum of the short-run explicit costs and short-run implicit costs incurred by an entrepreneur."*

It is important to understand that fixed costs are "fixed" only within a certain range of activity or over a certain period of time. If enough time passes, all costs become variable. Similarly, not all indirect costs are fixed costs; for example, advertising expenses are

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indirect costs that are variable over a slightly longer time frame, as they may not be subject to change in the short term, but may be easily adjustable over a longer time frame. The fixed costs are explained with the table and figure as given below:

Table 7.1 **Fixed cost**

Quantity of Output	*Fixed Cost*
0	20
1	20
2	20
3	20
4	20
5	20
6	20
7	20

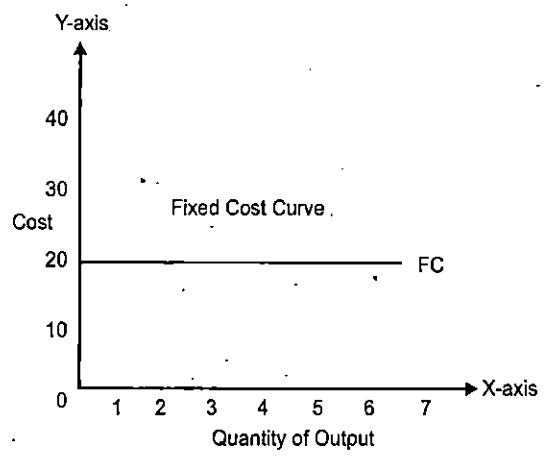

Figure 7.1

As given in the table 7.1 and figure 7.1, the quantity of the output causes no change in the fixed cost. Initially when the output is zero, fixed cost is ₹ 20. As the quantity of output is increases to one unit or two units or three units till seven units the fixed cost remains ₹ 20.

As shown in the figure 7.1, units of output on X-axis and Cost of production on Y-axis and FC is the fixed cost line. It is parallel to X-axis. As the quantity of output increase it remains constant. It will be seen from the above figure that fixed cost curve (FC) is start from a point on the Y-axis meaning there by that the fixed cost will be incurred even if the output is zero.

1.2 Variable Cost

Variable costs are costs that can be varied flexibly as conditions change. In other words the cost of variable factors used in the production is also called variable cost. The variable cost usually includes expenses on raw material, wages of labour, wear and tear charges, electricity charges etc.

Definition

Definition of different economist related to Variable Cost given as under:

Ferguson—*"Total variable cost is the sum of amounts spent for each of the variable input used."*

Variable costs are corporate expenses that vary in direct proportion to the quantity of output. Unlike fixed costs, which remain constant regardless of output, variable costs are a direct function of production volume, rising whenever production expands and falling whenever it contracts. Examples of common variable costs include raw materials, packaging,

and labour directly involved in a company's manufacturing process. The formula for calculating total variable cost is:

Total Variable Cost = Total Quantity of Output × Variable Cost per Unit of Output

In general, cost that change with changes in the quantity of output produced. Variable cost depends on the amount produced. If there is no production, then there is no variable cost and total cost will be equal to fixed cost. Variable costs also called avoidable costs or direct costs. The Variable costs are explained with the table and figure as given below:

Table 7.2 **Variable Cost**

Quantity of *Output*	Variable Cost
0	0
1	9
2	17
3	18
4	20
5	30
6	43
7	57

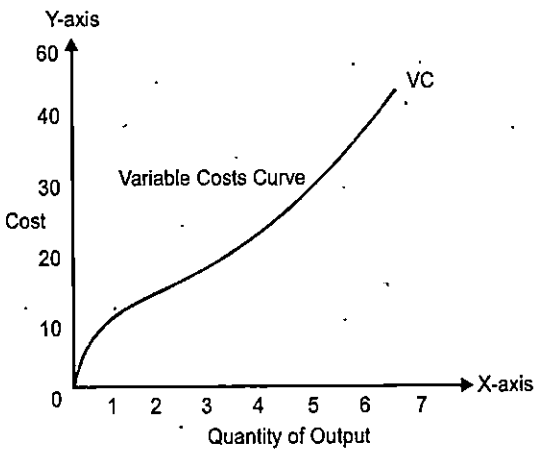

Figure 7.2

As shown in the table 7.2, as the quantity of output increases, variable cost also increases. Initially, when the output is zero the variable cost also zero. After that as the quantity of output increase the variable cost also increase and it is noted from the above table that the increase in the variable costs connected with each one unit increase in outputs are not constant. When one unit of output produced the variable costs are ₹ 9 and when the output is 7 units, variable costs reach to ₹ 57.

The variable cost curve illustrates the graphical relation between total variable cost and the quantity of output produced. As shown in figure 7.2, units of output on X-axis and Cost of production on Y-axis and VC is the variable cost curve. This VC curve shows that as the units of output increase the variable cost also increase. The variable cost curve is start form the origin which shows that when the output is zero the variable cost is also zero. The shape of the total variable cost curve reflects increasing marginal returns at small quantities of output and decreasing marginal returns at large quantities.

Relation between Total Cost, fixed Cost and Variable Cost

Total cost is the sum of the total fixed cost and total variable cost. The relation between the total cost, fixed cost and variable cost can be easily understood with the help of the following table 7.3 and figure 7.3. It will be seen from the table that the total fixed costs are equal to ₹ 20 and remain constant when output increase from 1 unit to 7 units of output. The variable costs are equal to ₹ 9 when only one unit of output produced and they rise to ₹ 57 when 7 units are produced.

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Table 7.3

Quantity of Output	*Fixed Cost*	*Variable Cost*	*Total Cost*
0	20	0	20
1	20	9	29
2	20	17	37
3	20	18	38
4	20	20	40
5	20	30	50
6	20	43	63
7	20	57	77

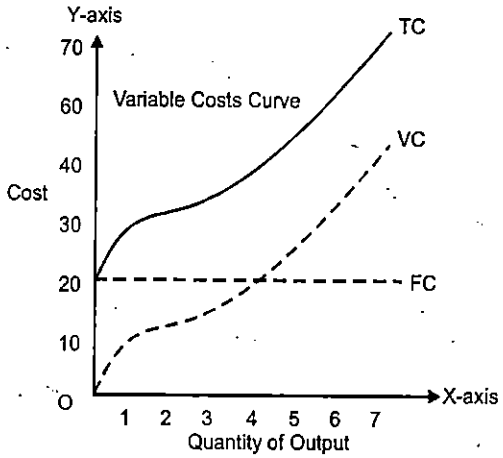

Figure 7.3

The total cost is the sum of fixed cost and variable cost, it can be obtained by adding the figures of column 2 (fixed cost) and column 3 (variable cost) of table 7.3. For example, when 3 units of output are produced, the total cost will be equal to ₹ 38 (₹ 20 + ₹ 18).

As shown in the figure 7.3, the quantity of output is measured on the X-axis and cost of production on the Y-axis. Since the fixed cost remains constant whatever the level of output, the fixed cost curve parallel to the X-axis. The variable cost (VC) starts from the origin which means that when the output is zero the variable cost also zero. The total cost curve is obtained by adding up vertically fixed cost and variable cost curve because the total cost is sum of fixed cost and variable cost. It will be seen that the vertical distance between the VC and TC curves is constant at the whole time. This is because the vertical distance between VC and TC curves represents the amount of fixed cost which remains unchanged as output is increase in the short-run. The shape of the total cost curve (TC) is exactly the same as the variable cost (VC) because the same vertical distance always separates the two curves. The total cost curve is frequently used with a total revenue curve to determine the profit maximizing level of production for a firm.

2. Average Cost

Average cost is the cost that incurred per unit of good produced. This is calculated by dividing the cost of production by the quantity of output produced.

$$\text{Average cost} = \frac{\text{Total cost}}{\text{Quantity of output}}$$

Definition

Definition of different economist related to Average Cost given as under:

Ferguson."Average cost (AC) is total cost divided by the output."

Average cost is a general term relating cost and the quantity of output, three specific average cost terms are average total cost, average variable cost, and average fixed cost.

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2.1 Average Fixed Cost

The average fixed cost is the total fixed cost per unit of output, found by dividing total fixed cost by the quantity of output.

The normal method of calculating average fixed cost is to divide total fixed cost by the quantity of output, illustrated by this equation:

$$\text{Average fixed cost (AFC)} = \frac{\text{Total fixed cost (TFC)}}{\text{Quantity of output (Q)}}$$

An alternative measurement for average fixed cost is found by subtracting average variable cost from average fixed cost:

Average fixed cost (AFC) = Average total cost (ATC) – Average variable cost (AVC)

Because fixed cost is constant, more quantity of output the lesser will be the fixed cost per unit of output. The average fixed cost can be explained with help of following table 7.4 and figure 7.4.

Table 7.4 **Average Fixed Cost**

Quantity of Output	*Total* Fixed Cost (₹)	*Average* Fixed Cost (₹)
0	20	0
1	20	20
2	20	10
3	20	6.6
4	20	5
5	20	4
6	20	3.3
7	20	2.8

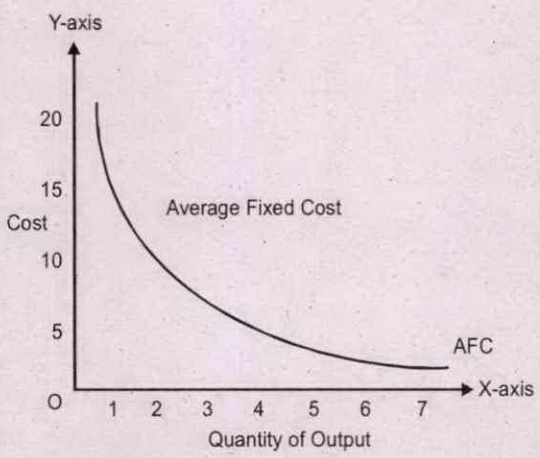

Figure 7.4

The average fixed cost is the fixed cost per unit of output. From the above table the total fixed cost is ₹ 20. when one unit of output is produced the average fixed cost is clearly ₹ 20 (20/1 = 20). As the output rising to 2 units, average fixed cost will be ₹ 10 (20/2 = 10). Further if output is increased to 7 units, average fixed cost falls to ₹ 2.8 (20/7 = 2.8). Average fixed cost curve (AFC) is shown in figure 14.4 above. It will be observed that average fixed cost curve continuously falls the whole time. It will be seen that average fixed cost curve approaches both axes asymptotically. In other words AFC curve gets very closer to but touches any axis. It is because the average fixed can never be zero. The shape of average fixed curve is rectangular hyperbolic.

2.2 Average Variable Cost

The average variable cost is the total variable cost per unit of output, found by dividing total variable cost by the quantity of output.

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The normal method of calculating average variable cost is to divide total variable cost by the quantity, illustrated by this equation:

$$\text{Average variable cost} = \frac{\text{Total variable cost (TVC)}}{\text{Quantity of output (Q)}}$$

An alternative measurement for average variable cost is found by subtracting average fixed cost from average total cost:

Average variable cost = Average total cost – Average fixed cost

The average variable cost will generally fall as output increases from zero to the normal capacity output due to the happening of increasing returns. Average fixed cost can be explained with the help of following table and figure:

Table 7.5 **Average Variable Cost**

Quantity of Output	*Total* Variable Cost (₹)	*Average* Variable Cost (₹)
0	0	0
1	9	9
2	17	8.5
3	18	6
4	20	5
5	30	6
6	43	7.1
7	57	8.1

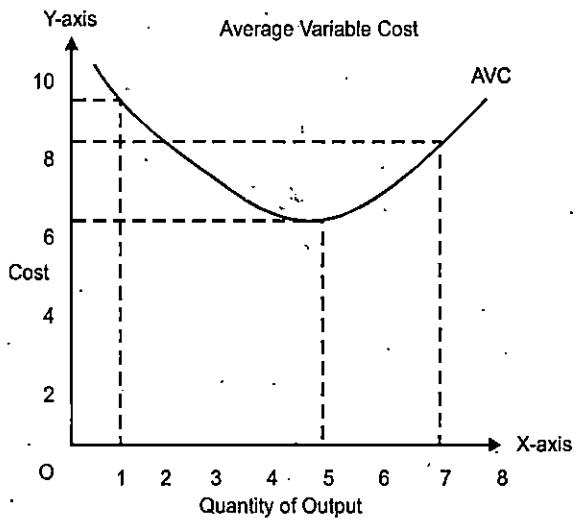

Figure 7.5

As shown in the table above the average variable cost can be obtained from dividing total variable cost (TVC) by quantity of output. It will be observed from the table that when 3 units of output are being produced, average variable cost can be found by dividing ₹ 18 by 3 which is equal to ₹ 6. Similarly, when 6 units of output are being produced, the average variable cost becomes ₹ 7.1. The average variable cost curve is shown in figure 7.5 above, by curve AVC which first falls, reaches a minimum and then rises.

2.3 Average Total Cost

Average total cost is the total cost per unit of output, found by dividing total cost by the quantity of output.

$$\text{Average total cost} = \frac{\text{Total Cost (TC)}}{\text{Quantity of output (Q)}}$$

Average total cost is also the sum of the average fixed cost and average variable cost.

$$\text{ATC} = \frac{\text{TC}}{\text{Q}} = \text{AFC} + \text{AVC}$$

Here ATC—Average total cost, TC—Total cost, AFC—Average fixed cost, AVC—Average variable cost)

Average total cost can be explained with the help of the following table 7.6 and figure 7.6:

Table 7.6 **Average Total Cost**

Quantity of Output	Average Fixed Cost (₹)	Average Variable Cost (₹)	Average Total Cost (₹)
0	0	0	0
1	20	9	29
2	10	8.5	18.5
3	6.6	6	12.6
4	5	5	10
5	4	6	10
6	3.3	7.1	10.4
7	2.8	8.1	10.9

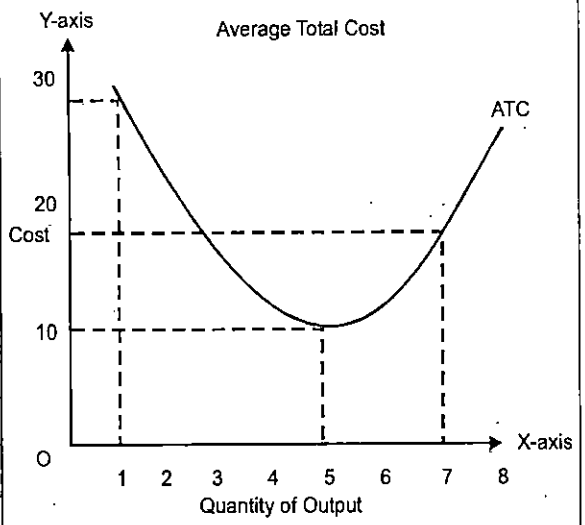

Figure 7.6

Average total cost is also called as unit cost, because it is cost per unit of output produced. As the average cost is the sum of average fixed cost and average variable cost, in table it can obtained by summing up the figures of column 2 and 3 related to different levels of output. Alternatively, the average total cost can be obtained directly from the dividing the total cost by the number of units of output produced. Average fixed cost has been falling up to fifth unit, because both AFC and AVC falling. It is become minimum when 5 units of output produced. After that, it begins to rise because AVC is also rising. It follows from above that the behaviour of the average total cost curve will depends upon the behaviour of the average fixed cost and average variable cost. In figure 7.6 above, units of output are shown on X-axis and cost on Y-axis. ATC is the average total cost curve. The average total cost curve almost of a 'U' shape.

3. Marginal Cost

The thought of marginal cost occupies a significant place in economics. The marginal cost is defined as the change in total cost resulting from a change in the quantity of output produced by a firm in the short run. Marginal cost (MC) indicates how much total cost changes for a given change in the quantity of output. Because changes in total cost are matched by changes in total variable cost in the short run (total fixed cost is fixed), marginal cost is the change in either total cost or total variable cost.

In other words marginal cost is the addition to the total cost caused by producing one more unit of output.

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Definitions

Some definitions of different economists related to Marginal Cost given as under:

McConell—*"Marginal cost may be defined as the additional cost of producing one more unit of output."*

Ferguson—*"Marginal cost is the addition to total cost due to the addition of one unit of output." Marginal cost is the addition to the total cost of producing n units instead of n–1 units (i.e., one less) here n is any given number. It can be given below as:*

$$MC = TCn - TCn-1$$

(Here MC—Marginal cost, TCn—Total cost of n units, TCn–1—Total cost of n–1 units)

For example, if the cost of making 9 pieces of pizza is ₹ 90 and the cost of making 10 pieces is ₹ 110, the marginal cost of producing the tenth piece of pizza is ₹ 20 (₹ 110 – ₹ 90).

It is also determined by dividing the change in total cost by the change in output. It can be written as:

$$MC = \frac{\Delta TC}{\Delta Q}$$

(Here MC = Marginal cost, ΔTC = Change in total cost, ΔQ = Change in output)

$$MC = \frac{\Delta TC}{\Delta Q} = \frac{\Delta FC}{\Delta Q} + \frac{\Delta VC}{\Delta Q}$$

The fixed cost does not change with output therefore ΔFC/ΔQ = 0, then

$$MC = \frac{\Delta VC}{\Delta Q}$$

It means that the marginal cost is not affected by fixed costs. It is only affected by variable cost, so marginal cost always the variable cost. The marginal cost is explained following with the help of table 7.7 and figure 7.7:

Table 7.7 **Marginal cost**

Quantity of Output	*Total* Cost (₹)	*Marginal* Cost (₹)
0	20	—
1	29	29 – 20 = 9
2	37	37 – 29 = 8
3	38	38 – 37 = 1
4	40	40 – 38 = 2
5	50	50 – 40 = 10
6	63	63 – 50 = 13
7	77	77 – 63 = 14

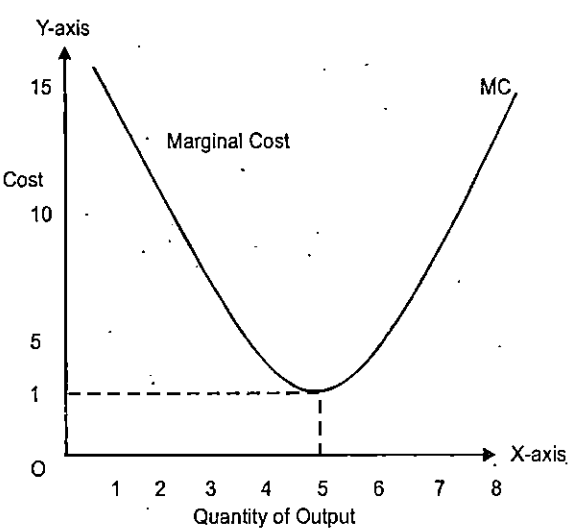

Figure 7.7

Let us illustrate the computation of marginal cost from a table of total cost and output. In the above table when output is zero in the short-run, the producer is incurring total cost of ₹ 20 which represents the total fixed cost of the production. When one unit of output is produced, the total cost rises to ₹ 29. The marginal cost of the first unit of output is then ₹ 9 (₹ 29 – 20 = 9). In this way marginal cost can be create for further units of output. In the above figure 7.7, units of output are shown on X-axis and Marginal cost on Y-axis. MC is the marginal cost curve. It is 'U' shaped telling that firstly it goes downward, become minimum and then upwards.

7.5 RELATION BETWEEN AVERAGE COST AND MARGINAL COST

There is an important relation between average and marginal cost, which is explained below. The relation between average cost and marginal cost is the same as that between any other average-marginal quantities.

Table 7.8

Quantity of Output	Fixed Cost (₹)	Variable Cost (₹)	Total Cost (₹)	Average Fixed Cost (₹)	Average Variable cost (₹)	Average Cost (₹)	Marginal Cost (₹)
0	20	0	20	0	0	0	—
1	20	9	29	20	9	29	9
2	20	17	37	10	8.5	18.5	8
3	20	18	38	6.6	6	12.6	1
4	20	20	40	5	5	10	2
5	20	30	50	4	6	10	10
6	20	43	63	3.3	7.1	10.4	13
7	20	57	77	2.8	8.1	10.9	14

When marginal cost is less than average cost, average cost falls and when marginal cost is greater than average cost, average cost rises. The relation is explained with the help of table 7.8 and figure 7.8:

1. When AC declines, MC is less than the AC. A general view that when average cost (AC0 decline, marginal cost (MC) decline faster. Yet this is not the case of whole time. Marginal cost reaches the

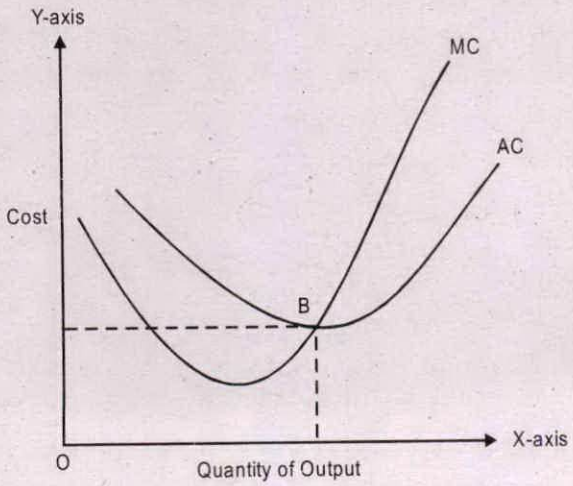

Figure 7.8

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minimum and then starts rising even when the average cost falling. The only point to be noted is that the marginal costs curve (MC) lies below the average cost curve (AC), till the average cost is falling.

2. When AC growing, MC is more that AC. When average cost (AC) is growing, the marginal cost (MC) is not only more than average cost (AC), but also growing faster than AC.

3. MC curve cut AC curve at AC's minimum point. The marginal cost (MC) is equal to average cost (AC), when AC become minimum. As shown in the table above that average cost is minimum *i.e.*, ₹ 10 when 4 and 5 units of output produced and marginal cost of 5 units is also equal to ₹ 10. The relation is derived from the fact that when average cost (AC) is constant, marginal cost (MC) is equal to AC. The above figure shows the relationship between the AC and MC in a clear way. The marginal cost curve cut the average cost curve at its lowest point B. The minimum point of marginal cost occurs earlier than the average cost.

4. Both AC and MC are calculated from total cost. Both the marginal cost and total cost are calculated from the total cost of production as given below:

$$\text{Average cost} = \frac{\text{Total cost}}{\text{Quantity of output}}$$

$$\text{Marginal cost} = \frac{\text{Change in total cost}}{\text{Change in quantity of output}}$$

Both the marginal cost and average cost curves are formed from total cost curve.

7.6 LONG-RUN COSTS

In economic, the long run is the time period in which all inputs (factors of production) are variable and firms can enter or exit any industry or market. Consequently, a firm's output and costs are unconstrained in the sense that the firm can produce any output level it chooses by employing the needed quantities of inputs (such as labour and capital) and incurring the total costs of producing that output level. A generic firm can make these changes in the long-run:

- Enter an industry
- Increase its plant
- Decrease its plant
- Leave an industry

The firm must decide what combination of inputs to use in producing any level of output. To produce any given level of output, the firm will choose the input mix with the lowest cost. In the long-run there are three concepts of costs like short-run such as (1) long-run total cost (2) long-run average cost (3) long-run marginal cost.

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7.6.1 Long-run Total Cost (LTC)

The long-run total cost is cost that incurred by all of the factors of production used in the long run (when all inputs are variable) by a firm to produce a good or service, including wages paid to labour, rent paid for the land, interest paid to capital owners, and a normal profit earned by entrepreneurs. Unlike short-run total cost, long-run total cost cannot be separated into fixed cost and variable cost. In the long run, all inputs are variable, so all cost is variable. In the other words the long-run total cost is the minimum cost at which each level of output can be produced.

Definition

"The long-run total cost of production is the least possible cost of producing any given level of output when all inputs are variable."

In the long run, the all inputs under the control of the firm are variable, there is no fixed cost. The a firm can produced any level of output at the lowest cost since it has enough time to manage a particular plant size and to take least cost factors of production. This means that the long-run total cost is never more than short-run total cost. It is always less than or equal to the short run total cost.

The shape of the long-run total cost curve displayed below figure 7.9 and 7.10 is inverse S-shaped, much like a short-run total cost curve. The STC_1 and STC_2 are short-run total cost curves of a firm inter-related with different plant size. The long-run total cost curve is made by combining the lower points of different short-run total cost curves. For relatively small quantities of output, the slope begins to flatten. Then for larger quantities the slope makes a turn-around and becomes steeper. This shape, however, is not the result of increasing, then decreasing marginal returns that surface when a variable input is added to a fixed input in the short run.

Characteristics of Long-run Total Cost

As shown in the figure below the shape of long-run total cost is inverse 'S' shape. The main characteristics of long-run total cost are given below:

1. The long-run total cost curve represents the minimum cost of production for different levels of output.
2. The slope of long-run total cost is positive *i.e.*, increase with increase in production.
3. The long-run total cost curve is constructed by joining the lowest point of various points of short-run total cost curves.
4. The long-run total cost first increase with decreasing rate and remain constant for whole time.
5. The long-run total cost curve start from the point of origin because in the long-run all the factors of production are variable so there cost is zero when quantity of production is zero.

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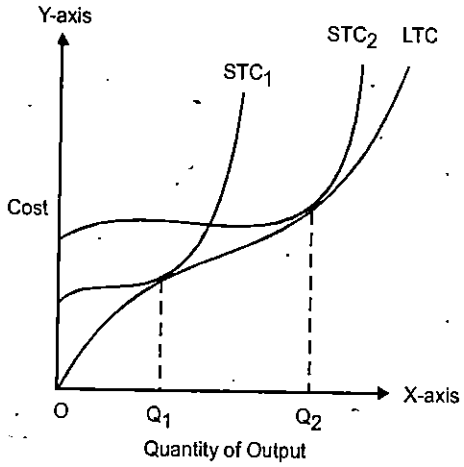

Fig. 7.9

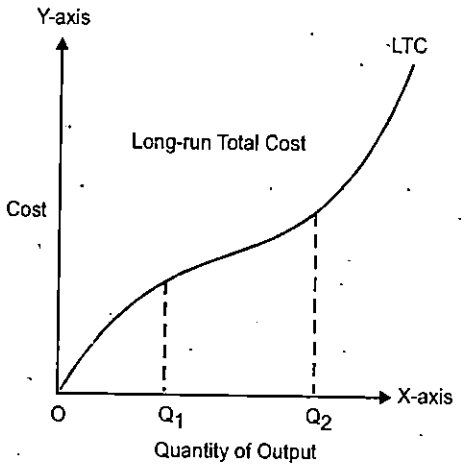

Fig. 7.10

7.6.2 Long-run Average Cost (LAC)

The long-run average cost refers to per unit cost of producing a goods or service in the long run when all inputs under the control of the firm are variable. In other words, long-run total cost divided by the quantity of output produced.

$$\text{Long-run Average cost (LAC)} = \frac{\text{Long-run total cost}}{\text{No.of units of output}}$$

Definitions

Some definitions of different economists related to Long-run Average Cost given as under:

Mansfield—"*The long-run average cost curve is that curve which shows the minimum cost per unit of producing each output level, corresponding to different scale of productivity.*"

Koutsoyiannis—"*The long-run average cost curve is a planning curve, in the sense that it is a guide to the entrepreneur in his decisions to plan the feature expansion of his output.*"

The long-run average cost is the long-run total cost divided by the level of output produced. The long-run average cost curve depicts the least possible average cost for producing all possible levels of output. Suppose a firm have two plants and there short-run average curves are SAC_1 and SAC_2 as shown in figure 7.11. These short-run average cost curves are called plant curves, since in the short-run plant is fixed and each of the short-run average cost curves corresponds to a particular plant. In the long-run the firm plan to invest in the most profitable one. This can be find out with the help of these two short-run average cost curves as to which plant will be suitable to produce different levels of output at the lowest cost.

As shown in figure 7.11, SAC_1 and SAC_2 are the short-run average cost curve of both plants. In first case the firm produced OQ_1 quantity of output, the minimum per unit cost

possible in this case is AQ_1 as shown by curve SAC_1 in figure 7.11. It will be increases to CQ_1, if production is takes place with another plant (SAC_2). In the second case if the firm want to produced large amount of output *i.e.*, OQ_2. The minimum per unit cost will be BQ_2 if the same output produced by the first plant the per unit cost increase from BQ_2 to DQ_2. As a result the first plant produced OQ_1 quantity of output at the minimum average cost AQ_1 and the second plant produced OQ_2 output at the minimum average cost BQ_2.

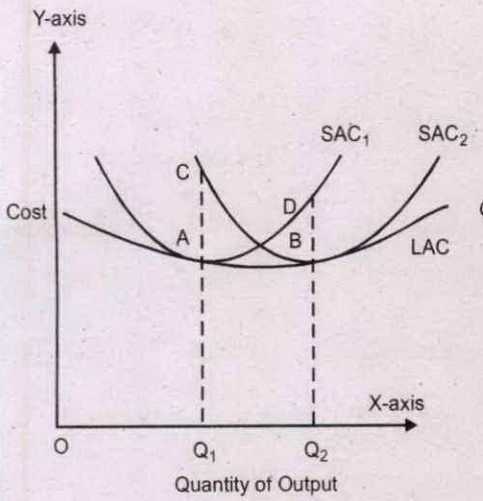

Fig. 7.11

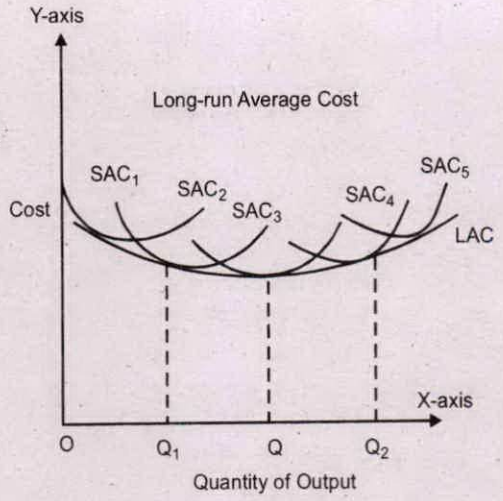

Fig. 7.12

Assume now that the size of the plant can be varied by infinitely small gradations so that there are infinite numbers of plants corresponding to which there numerous short-run average cost curves. As shown in figure 7.12, the long-run average cost curve (LAC) is the tangent to each of these short-run average cost curves. The long-run average cost curve first fall and then beyond a certain point it rise, that is, the long-run average cost curve is 'U' shaped, though the 'U' shape of the long-run average cost curve is less pronounced than that of the short-run average cost curve. The long-run average cost curve is lowest at output OQ. The long-run average cost fall upto the output OQ and it rises beyond OQ.

Why LAC Curve is 'U' shaped?

It is generally believed by economists that the long-run average cost curve is normally U-shaped. It means that the long-run average cost first declines as output increased and then beyond a certain point it rises. The U-shape of short-run average cost is explained with the help of law of variable proportion. But the long-run average cost is depends upon the returns scale. In the long-run all inputs are including capital and labour can be changed, the relevant concept governing the shape of long-run average cost is the returns to scale. It is because in the beginning the long-run average cost of production falls as output is increased and in the other way, it is because of decreasing returns to scale that the long-run average cost rises beyond a certain point.

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Characteristics of LAC Curve

The long-run average cost curve is of U-shaped and it is always less than the short-run average cost. Some other characteristics are given below:

1. The long-run average cost curve is always of U-shaped. This means that it decline to certain point and then it start to rise.
2. The long-run average cost curve constructed with the help of short-run average costs.
3. The long-run average cost is always less then or equal to short-run average cost.
4. The long-run average cost never intersect short-run average cost curve. However it touches all these short-run average cost curves.
5. The long-run average cost curve touches the short-run average cost curve at the point of minimum cost.

7.6.3 Long-run Marginal Cost

The change in the long-run total cost of producing a good or service, due to producing one additional unit of a commodity. It is the change in long-run total cost divided by, or resulting from, a change in quantity. Long-run marginal cost is guided by returns to scale rather than marginal returns.

$$\text{Long-run marginal cost} = \frac{\text{Change in long-run total cost } (\Delta LTC)}{\text{Change in quantity of output } \Delta Q}$$

Definition

Definition of different economist related to Long-run Marginal Cost given as under:

Ferguson—"*Long-run marginal cost is the addition to total cost attributable to an additional unit of output when all inputs are optionally adjusted.*"

The long-run marginal cost curve is shown in the figure 7.13. LMC is the long-run marginal cost. As shown in the figure it is first fall, reaches lowest and the rises.

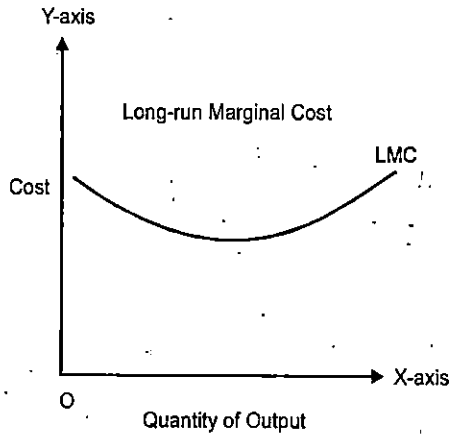

Fig. 7.13

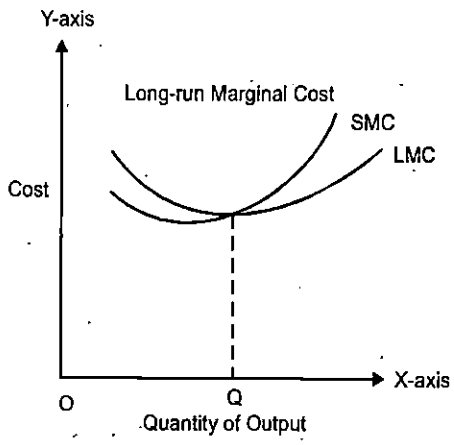

Fig. 7.14

In the long-run scale economies and returns to scale generally produce a U-shaped long-run marginal cost curve, as displayed below. For relatively small quantities of output, the curve is negatively sloped. Then for large quantities the curve is positively sloped.

While the shape of the long-run marginal cost curve looks surprisingly like that of a short-run marginal cost curve, the essential forces are different. This U-shape is not the result of increasing, then decreasing marginal returns that surface in the short run when a variable input is added to a fixed input. The negatively-sloped portion of this long-run marginal cost curve reflects economies of scale and increasing returns to scale. The positively-sloped portion reflects diseconomies of scale or marginal returns to scale.

7.6.4 Long-run and Short-run Marginal Costs

In the long run, when all inputs under the control of the firm are variable, there are no fixed inputs, thus the increasing and decreasing marginal returns, and especially the law of diminishing marginal returns, are not relevant to long-run marginal cost. There are two similar causes, economies of scale (increasing returns to scale) and diseconomies of scale (decreasing returns to scale).

As shown in the figure the short-run marginal cost curve refers to effect on total cost due to production of one more unit of output on the relation of change in variable factors and the long-run marginal cost curve refers to change in total cost due to production of one more unit of output as a result of change in all factors of production (including factors which are fixed in short-run).

The Short-run

In the short-run, marginal cost decreases due to increasing marginal returns and increases due to decreasing marginal returns and the law of diminishing marginal returns. This is also due to changes in average cost (variable and total).

The Long-run

In the long-run, there are no fixed inputs. As such, marginal returns and especially the law of diminishing marginal returns do not operate and thus do not guide production and cost. Instead long-run marginal cost is affected by increasing and decreasing returns to scale, which translates into economies of scale and diseconomies of scale.

As shown in figure SMC is the short-run marginal cost curve and LMC is the long-run marginal cost curve. If a firm selects optimum scale of plant in order to produce a level of output, then at this quantity of output, the short-run and long-run marginal curves are equal (SMC = LMC). The OQ is the optimum quantity of output where the long-run marginal cost curve equal to the short-run marginal cost curve. If the quantity of output is more than the optimum level, then SMC will be more while LMC relatively less. In other way if the quantity of output is less than the optimum level, than SMC will be less while LMC relatively more.

7.7 SHORT-RUN AND LONG-RUN COSTS

The fixed input is commonly considered to be some aspect of capital, such the production facility, but may also be a normally variable input that is fixed because of production technology requirements, or a contractual commitment (*e.g.*, a facility lease) related to

NOTES

production. So when one refers to short-run analysis, the analysis is focused on a planning period in which some input is fixed and others are variable, and the manager is selecting levels of variable input and production output to optimize given the constraint of the fixed input.

The actual time period that makes up the economic short run depends on how long the fixed input remains fixed. A pizza shop whose primary fixed input in the short run is their lease on their facility has a short-run planning horizon equal to the period of time remaining in their lease, which may be 6 months or 2 years. A utility with a new coal-fired electric generating plant faces an economic short run planning period for that plant that may span 20 years or more. In contrast, the economic long run is a planning horizon that looks beyond current commitments to a future period in which all inputs can be varied. A typical long-run analytical problem is the decision of whether to adjust capacity, seek a larger (or smaller) facility, to change product lines, or to adopt a new technology.

At any given time managers must be concerned with both short-run and long-run analysis. Firms must be concerned with both the problem of optimizing in the current (short-run) situation as well positioning the firm for optimizing in the future (long-run). By definition, **fixed costs** do not vary with the volume of goods or services produced as output. Fixed costs are the costs associated with the fixed inputs that define the economic short run. Thus fixed costs are only relevant in the economic short run. Even if the firm temporarily shuts down, it still continues to incur the fixed cost expense. This is typical of capital loans or facility lease agreements. **Variable costs**, in contrast, vary (usually directly) with the volume of good or services produced as output, and thus can be avoided by a temporary shut down.

7.8 SUMMARY

- In a basic economic sense, cost is the measure of the alternative opportunities forgone in the choice of one goods or activity over others. For consumers, cost describes the price paid for goods and services. For producers, cost has to do with the relationship between the value of production inputs and the level of output.
- In the common sense, the measure of the value of what has to be given up in order to achieve a particular objective. In everyday language, people most often use the term rather like an accountant does, as synonymous with the total money outlays actually paid out to achieve the objective, but this is not precisely what economists mean by the term.
- Social cost includes all the costs of production of the output of a particular goods or service.
- Private cost is the cost that the buyer of a goods or service pays the seller.
- Opportunity cost is a one of the most fundamental concepts used in the study of economics. An opportunity cost can be either explicit, usually involving a monetary payment, or implicit, which does not involve a transaction. Opportunity cost is also commonly termed economic cost.

- Explicit cost is that cost which involves a monetary payment or some other form of reward.
- Implicit cost is that cost which does not involve a monetary payment or any other form of compensation.
- In economics sunk costs are the costs that have already been incurred and which cannot be recovered to any significant degree.
- The cost function is a function of input prices and output quantity.
- The short-run costs are directly related to short-run productivity.
- Total cost is the sum of the total fixed cost and total variable cost.
- Average total cost is the total cost per unit of output, found by dividing total cost by the quantity of output.
- The long-run total cost is cost that incurred by all of the factors of production used in the long run (when all inputs are variable) by a firm to produce a goods or service, including wages paid to labour, rent paid for the land, interest paid to capital owners, and a normal profit earned by entrepreneurs.
- The long-run average cost refers to per unit cost of producing a goods or services in the long run when all inputs under the control of the firm are variable.

7.9 REVIEW QUESTIONS

1. Define the following terms:
   (*a*) Total cost
   (*b*) Average cost
   (*c*) Marginal cost
   (*d*) Fixed cost
   (*e*) Variable cost
2. What do you understand by total cost, average cost and marginal cost? Explain the relation between average cost and marginal cost.
3. Differentiate the fixed cost and variable cost.
4. Explain the long-run marginal cost and total cost with the help of table and figure.
5. How the long-run average cost prepared from short-run cost curves?
6. Explain the following:
   (*a*) Describe about the average cost with table and figure.
   (*b*) Why the average cost curve of a firm is "U" shaped?
   (*c*) Describe about different type of costs.
7. When the output of a firm increase the average variable cost and average total cost come closer and why never meet?

BBA-102

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