

# GENERAL ECONOMICS

Study material

COMPLEMENTARY COURSE

For

**BA HISTORY/BA POLITICAL SCIENCE**

**II SEMESTER**

**(2011 Admission)**



**UNIVERSITY OF CALICUT**  
**SCHOOL OF DISTANCE EDUCATION**

CALICUT UNIVERSITY P.O. MALAPPURAM, KERALA, INDIA - 673 635



# UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

## Study material

COMPLEMENTARY COURSE

For II SEMESTER BA HISTORY/BA POLITICAL SCIENCE

### **GENERAL ECONOMICS**

#### **Prepared by**

#### **Modules**

I & IV	Sri.Shareef P., Assistant Professor, Department of Economics, Govt. College, Kodanchery
II, III	Mr. K.P. Shabeer Assistant Professor, Department of Economics, Government College, Kodanchery
V, VI, VII	Sri.Abdul Kareem O.C., Assistant Professor, Department of Economics, Government College, Kodanchery

**Edited & Scrutinised by**

:

**Dr.C.KRISHNAN**

Associate Professor,  
Department of Economics,  
Govt. College, Kodanchery

©

Reserved

## CONTENTS

<b>MODULE I</b>	<b>INTRODUCTION TO ECONOMICS</b>	<b>5</b>
<b>MODULE II</b>	<b>THEORY OF DEMAND</b>	<b>11</b>
<b>MODULE III</b>	<b>THEORY OF SUPPLY</b>	<b>26</b>
<b>MODULE IV</b>	<b>THEORY OF PRODUCTION</b>	<b>43</b>
<b>MODULE V</b>	<b>NATIONAL INCOME</b>	<b>50</b>
<b>MODULE VI</b>	<b>MAJOR CLASSICAL POSTULATES</b>	<b>59</b>
<b>MODULE VII</b>	<b>KEYNESIAN CONCEPTS</b>	<b>62</b>



## MODULE I

# INTRODUCTION TO ECONOMICS

What Economics is about? – Importance of the study of economics, relation with other social sciences (History, Political science, Law, Psychology, Sociology)- Basic problems-Micro versus macro

### What economics is about?

Economics is a social science that deals with human wants and their satisfaction. People have unlimited wants. But the resources to satisfy these wants are limited. They are always engaged in work to secure the things they need for the satisfaction of their wants. The farmer in the field, the worker in the factory, the clerk in the office, and the teacher in the school are all at work. The basic question that arises here is: Why different people undertake these activities? The answer is that they are working to earn income with which they satisfy their wants.

People have multiple wants to satisfy. They have to satisfy their want for food, cloth, shelter, education, health, etc. Thus human wants are unlimited. In a sense they are insatiable. When one want is satisfied another want takes its place and so on in an endless succession. By doing some work or activity people earn money. This money is used to satisfy their wants. Thus our activities have two common aspects; first, we are all engaged in earning our living, and secondly, these earnings enable us to satisfy our want for different goods and services. This *action of earning and spending* is called *economic activity*.

Prof. Seligman says, “the starting point of all economic activity is the existence of human wants”. Wants give rise to efforts and efforts secure satisfaction. The things which directly satisfy human wants are called consumption goods. A few consumption goods like air, sunshine, etc. are abundant . They are available at free cost. But most of goods are scarce. They are available only by paying a price. And, therefore, they are called economic goods. They do not exist in sufficient quantity to satisfy all wants.

People everywhere are engaged in some kind of economic activity for satisfaction of their wants. "Wants, efforts, satisfaction" said Bastiat "constitute the circle of economics".

The subject matter of economics is generally divided into four parts. They are Production, Consumption, Exchange and Distribution. Production means producing things or creation or addition of utilities to the goods and services to make them capable of satisfying various wants Consumption deals with human wants and their satisfaction. Exchange refers to transfer of goods and services through the medium of money and various credit instruments. Finally, distribution refers to the sharing of income from production by four factors of production namely, land, labour, capital and organization. Here, we study how wage, rent, interest and profit is determined.

In addition, we also study, Public Finance and Planning. Public finance studies the financial operations of the governments and other public bodies. Here we study, how the government collects money, how it spends and how it frames its fiscal policy. Planning is also included in the subject matter of economics which refers to the systematic, efficient and full utilization of available limited resources for the maximum public welfare.

## How other Social sciences are related to Economics?

Economics is closely related to other social sciences especially History, Political science, Law, Psychology and Sociology. The whole discussion of value, as we shall see, depends intimately upon considerations of psychology. Sociology is sometimes defined as the social science, that is, the science of all social relations. If sociology is considered in this sense, Economics is a branch of sociology. Other writers hold that sociology deals only with the more general laws which apply to the whole social structure and that it is coordinate with economics and politics and ethics, and not inclusive of them all.

Politics is the science of the state and because of many important ways in which the state influences, and is influenced by the manner in which its people make a living, the fields of the two sciences are closely interwoven and have many problems in common.

Ethics is the science of moral conduct. It asks the question what ought to be. There was a time when economists held that economics was concerned only with the question, what is, and not with the question, what ought to be. But now a days most of the economists considered economics as a positive science as well as a normative science.

Economics is also closely related to the science of law. Government and law form a framework in which economic forces act. Thus Economics is the repository of information on resource dynamics. Similar to agriculture and human survival, social sciences must continue to appreciate economics for an ever growing matrix of phenomena which upon analysis facilitate learning in every discipline.

## The Central Economic Problem

Economic problem arises because of scarcity of resources in relation to demand for them. Prof. Lionel Robbins of London School of Economics has defined economics as a "science which studies human behavior as a relationship between ends and scarce means which have alternative uses". Accordingly, he has given the following reasons for emergence of economic problems;

1. Human wants(or ends) are unlimited

Man is a bundle of wants. There is no end to human wants. As one want is satisfied, many others crop up and this goes on endlessly. Again one particular want cannot be satisfied for all times to come e.g. want for food. After fulfilling it at a particular time, it crops up again and again. Thus wants are not only unlimited but recurring in nature also. In this sense they are insatiable. Wants differ in urgency or intensity. Some wants are more important while others are less important. This enables a man to arrange his wants in order of preference and make a choice among different wants.

2. Resources (means) to satisfy wants are limited (scarce)

Goods and services are produced by an economy with its resources namely-land, labour, capital and enterprise. Unfortunately, such resources are limited in relation to its demand. Due to scarcity of resources, we cannot produce all the goods and services that the various sections of the society need. If more resources are employed for the production of one commodity, less resources are left for production of other goods. Consequently, some wants will have to go unsatisfied. Therefore an economy has to decide how to make best possible use of its limited resources.

3. Resources have alternative uses

The resources of an economy are not only scarce but also have alternative uses and therefore choice has to be made in their use. For example, a plot of land can be used to produce wheat or for construction of a factory or for a school building. If the plot is used for the cultivation of wheat, it cannot be used for other purposes. In other words, production of one commodity has to be sacrificed for production of other. Thus, the economy is constantly faced with choosing better alternative uses to which its resources should be put.

In short, the problem of making a choice among alternative uses of resources is called the basic or central problem of an economy. Such problems are common to all economies. The central problems relating to different aspects of resources are cited below;

I. The problem of allocation of resources:

- (a) What to produce
- (b) How to produce
- (c) For whom to produce

II. The problem of utilization of resources:

- (a) Problem of efficiency in production and distribution
- (b) Problem of full employment of resources
- (c) The problem of growth of resources

### **The problem of allocation of resources**

An economy has to allocate its scarce resources in such a way that serves the best needs of the society. This problem is in fact the problem of 'what, how and for whom to produce?'

**(1) What to produce and in what quantities?**

Since human wants are unlimited and the resources of the economy to satisfy them are limited the economy cannot produce all goods and services required by the people. More of one

good or service produced means less of other goods. Therefore every society must exactly choose which goods and services are to be produced and in what quantities. For instance, the economy has to decide whether the resources are to be allocated for the production of consumer goods or capital goods, or necessary goods or luxurious goods or civil goods or military goods. After deciding which goods should be produced society has to decide the quantity of each good has to be produces.

**(2) How to produce?**

This problem refers to the choice of technique of production. It means that which combination of resources or factors to be used for the production of goods and services. There are two types of techniques of production. ie. the capital intensive technique of production and labour intensive techniques of production. More labour and less capital or relatively less labour and more capital can be used for production. Similarly, small scale or large scale production can be used. The guiding principle here is that only those techniques should be employed which cause the least possible cost to produce each unit of a commodity or service.

**(3) For whom to produce?**

This problem refers who will consume the goods and services produces. A few rich and many poor or vice-versa?. The goods and services produced for the people who can purchase them. And the purchasing power of the people depends on how the produced goods and services are distributed among the people who are helped to produce them. i.e., how is the product distributed among the four factors of production-land, labour, capital and enterprise.

**The problem of full utilization of resources** is concerned with (i) how to ensure that limited resources of the economy are used most efficiently and (ii) how to secure full employment of resources as discussed below.

**(4) The problem of efficiency in production and distribution.**

Efficiency in production and distribution is another problem which follows automatically the first three problems mentioned above. Since the resources are limited , it is very important that they are efficiently used. By efficiency we mean that resources are being put to their best possible use. Allocation of resources in production is considered efficient when any other alternate allocation cannot increase production of an article even by one unit. Likewise distribution of production among agents of production is said to be efficient when alternate distribution does not make even one person better off without affecting others adversely.

**(5) The problem of full employment of resources.**

The problem of full employment of resources implies that existing resources, scarce as they are, should not remain unutilized or under-utilized. Production and supply of goods in every economy is generally always small than the demand for them. Hence to maximize production, all the available resources need to be fully utilized. In fact unemployment or under employment of resources is nothing but wastage of resources. Therefore, an economy has to ensure that its resources are fully employed.

**(6) The problem of growth of resources.**



Since scarcity of resources is a basic fact of life, its impact can be lessened to some extent through growth of resources. Again the scarce resources exhaust gradually on being used. Therefore, to make up their deficiency, growth of resources has become another basic problem of an economy. Economic growth involves expansion of resources and improvement in technology. It is through effective growth of resources and improved technology by countries like America, Canada, Russia, West European countries and Japan that their economies are rich and developed leading to a higher standard of living. It has, therefore, become most essential for all economies especially the poor ones to not only make full use of their resources but also ensure to grow them so as to meet ever increasing demand of their people for goods and services.

### **(7) The problem of economic growth**

Every economy in this world is aiming at its rapid economic growth so as to ensure continuous rise in the living standard of its citizens. For underdeveloped countries, the problem of economic growth is highly crucial and significant because they have to grow at a higher rate to bring the living standard of their people to the level of developed countries. For this, the rate of economic growth needs to be kept higher than the rate of increase in population. Therefore, an economy has to explore potentials of its growth and generate new resources so that its capacity to produce more goods from year to year.

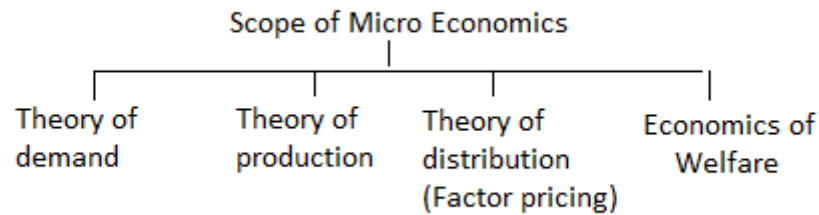
### **Subject matter: Micro and Macro Economics**

The subject matter of economics has been divided into two parts- Micro economics and Macro economics. Ragner Frisch of Oslo University (Norway) was the first economist to use these terms in 1933 which now have been adopted by economists all over the world.

#### **Micro Economics**

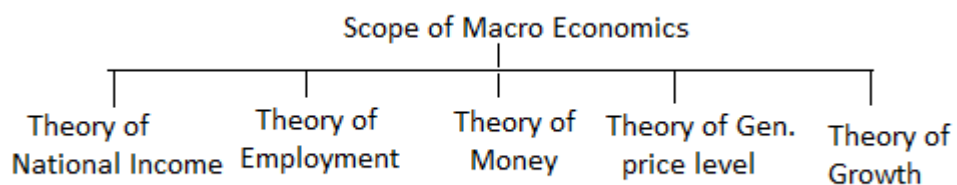
The term 'micro' is derived from the Greek word 'mikros' which means 'small'. Therefore micro economics studies the economic behavior of individual units of an economy and not an economy as a whole. It concerns itself with the detailed study of individual decision-makers like a household, a firm or individual consumers and producers. How a consumer maximizes his satisfaction with his limited income or how a firm maximizes its profits or how the wage of a worker is determined are all instances of micro analytical approach.

According to Prof. Boulding "*Micro economics is the study of particular firms, particular households, individual prices, particular households, individual prices, wage incomes, individual industries, particular commodities*". Micro economic analysis is also known as 'microscopic analysis'. Since the subject matter of micro economics deals with the determination of factor prices and product prices micro economics is called as 'price theory'.



## Macro Economics

The word ‘macro’ is derived from the Greek word ‘makros’ which means ‘large’. Therefore macro economics is the study of economy in its totality or as a whole. *It is concerned with the study of national income and not individual income, national saving and not individual saving, aggregate consumption expenditure and not individual consumption expenditure, total production and not production of individual firm, price level and not individual price etc.* In short it deals with the economy as a whole. The problem of full employment, aggregate consumption, aggregate investment, total savings, general level of prices and variations in them are all the subject matter of macro economics.



The following comparison further clarifies the distinction.

<b>Micro Economics</b>	<b>Macro Economics</b>
1. It deals with the study of individual economic units.	1. It deals with the study of economy as a whole and its aggregates.
2. It deals with the individual income, individual prices , individual output, etc.	2. It deals with national income, price level, national output, etc.
3. The central problem is price determination of commodities and factors of production.	3. The central problem is the determination of level of income and employment.
4. Its main tools are demand and supply of particular commodity/factor.	4. Its main tools are aggregate demand and aggregate supply of the economy as a whole.
5. It deals with partial equilibrium analysis	5. It deals with the general equilibrium analysis

Suggested Readings:

1. Diwedi DN ‘Macroeconomics Theory and Policy’ Tata McGraw-Hill
2. Dominick Salvatore ‘Microeconomic Theory’, Schuam’s Outline Series
3. Edward Shapiro : ‘Macro economics’ Oxford University press.
4. Gregory Mankiw : ‘Macro economics’ – 6th Edn. Tata McGraw Hill.
5. A. Koutsoyannis : Modern Microeconomics, - Macmillan

## Module II

# Theory of Demand

Utility; utility function; marginal utility; law of diminishing marginal utility; demand; law of demand; Elasticity of demand and its types.

### The Concept of Utility

The concept of utility was introduced to social thoughts by Jeremy Bentham in 1789 and to economic thoughts by Jevons in 1871. The term utility refers to the want satisfying power of a commodity or service. It is the power of a commodity or service to satisfy a want. It is the value in use of the commodity or service because the satisfaction we get from the consumption of a commodity or service is its value in use. Utility is subjective. Utility of a good varies from person to person. It is a psychological phenomenon. It is the feeling of satisfaction, pleasure, happiness or wellbeing which a person derives from the consumption or possession of a commodity or service. Commodity may be poisonous or dangerous to one’s health, but it possesses utility for those who want them. Thus, utility does not carry any ethical connotation.

### Total Utility and Marginal Utility

Total Utility (TU) is the total amount of satisfaction obtained from the consumption of all the units of the commodity. It is the utility derived from all units of the commodity consumed within a specified time period. It is the sum of utilities which the consumer obtains from the consumption of all the units of commodity.

Marginal Utility (MU) is the additional utility obtained from the consumption of an additional unit of the commodity. It is the additional utility derived from the consumption of an additional unit of the commodity. Marginal Utility is the addition made to total utility when one more unit of the commodity is consumed. It is the utility from the last unit. We can express marginal utility as

$$MU = \Delta TU / \Delta Q$$

Thus, MU is the change in total utility ( $\Delta TU$ ) as a result of a change in quantity consumed ( $\Delta Q$ ). The symbol  $\Delta$  is Greek letter delta; it means “the change in”. Algebraically, we can also represent marginal utility of  $N^{\text{th}}$  unit of a commodity is the total utility of  $N$  units minus the total utility of  $N-1$  units. Thus,

$$MU_N = TU_N - TU_{N-1}$$

### The Law of Diminishing Marginal Utility

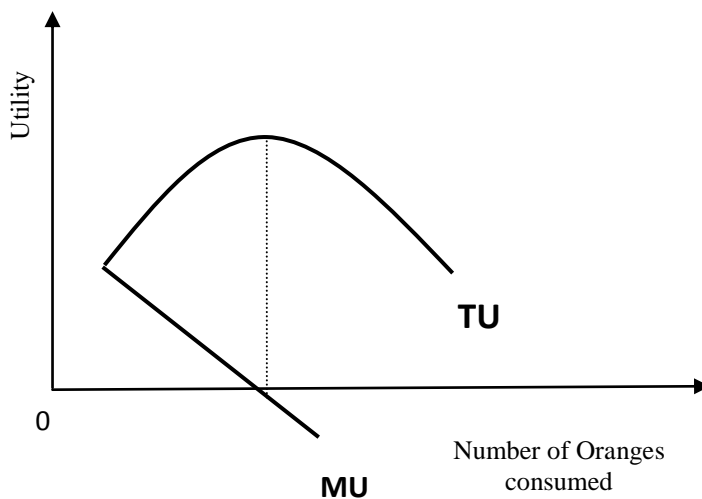
The earliest formulation of law of diminishing marginal utility was by Hermann Heinrich Gossen in 1854. But it was Alfred Marshall popularized it and gave the name law of diminishing marginal utility. The law states that marginal utility of a commodity diminishes as an individual consume more and more of the commodity. That is, as we consume more and more of commodity the utility derived from the addition unit diminishes. The law of diminishing marginal utility means that the total utility increases at a decreasing rate.

As an individual consume more and more of a commodity within a limited time period, the marginal utility of the additional unit decreases, becomes zero and if consumption is continued becomes negative. This human psychological experience is called the law of diminishing marginal utility. In the words of Marshall “the additional benefit which a person derives from a given increase of his stock of a thing diminishes with every increase in the stock that he already has”. The law of diminishing marginal utility describes a familiar and fundamental tendency of human nature. This law has been arrived at by introspection and by observing how people behave. The following table shows the total and marginal utilities derived by a person from the consumption of oranges.

No of Oranges consumed	Total Utility (In utils)	Marginal Utility (In utils)
1	10	10
2	18	8
3	24	6
4	28	4
5	30	2

6	30	0
7	28	-2
8	24	-4

The table shows that as the consumption of oranges increases marginal utility falls. That is, total utility is increasing at a diminishing rate. However, when number of oranges consumed increases to seven, marginal utility becomes negative and total utility starts declining. The law of diminishing marginal utility is diagrammatically illustrated below.



The figure shows that although total utility is increasing, it increases at a decreasing rate. Marginal utility is decreasing and when TU reaches its maximum MU is zero. When TU starts declining MU becomes negative. The significance of the diminishing marginal utility of a commodity for the theory of demand is that the quantity demanded of the commodity rises as the price falls and vice versa. Thus, it is because of the diminishing marginal utility that the demand curve slopes downwards.

## The Nature of Demand

In economics, demand refers to the various quantities of a good or service that people will be able to purchase at various prices during a period of time. It is important to note that a mere desire for a good or service does not constitute demand. Demand implies both the desire to purchase and ability to pay for the good. Unless demand is backed by purchasing power, it does not constitute demand. Further, demand does not refer to the specific quantity that will be purchased at some particular price, but refer to a series of quantities and their associated prices.

## Demand Function

Demand for a commodity is determined by several factors. An individual's demand for a commodity depends on the own price of the commodity, his income, prices of related commodities, his tastes and preferences, advertisement expenditure made by the producers of the commodity, expectations

etc. Thus, individual's demand for a commodity can be expressed in the following general functional form,

$$Q_x^d = f(P_x, I, P_r, T, A, E)$$

Where,

$Q_x^d$  = Quantity demanded of commodity "x"

$P_x$  = Price of commodity x

I = Income of the individual consumer

$P_r$  = Price of related commodities

T = Tastes and preferences of individual consumer

A = Advertisement expenditure

E = Expectations

The demand function is just a short hand way of saying that quantity demanded , which is recorded in the left hand side depends on the variables that are recorded on the right hand side. For many purposes in economics, it is useful to focus on the relationship between quantity demanded of a good and its own price, while keeping other determining factors constant. Thus, we can write the demand function as

$$Q_x^d = f(P_x)$$

This implies that the quantity demanded of the commodity x is a function of its own price, other determinants remaining constant.

## **Law of Demand**

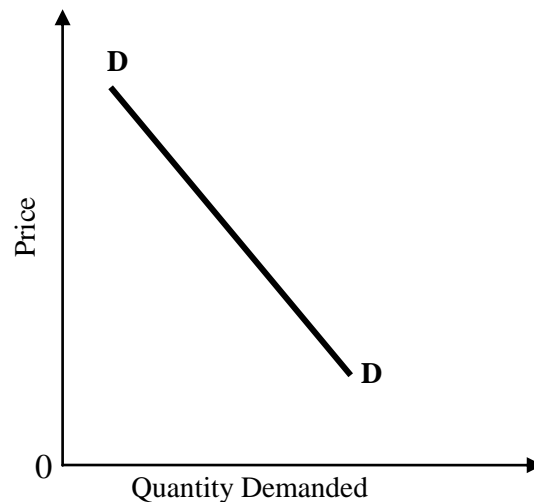
Law of demand expresses the functional relationship between price and quantity demanded. According to the law of demand, other things being equal, if the price of the commodity falls the quantity demanded of it will rise and if the price of the commodity rises, its quantity demanded will decline. Thus, according to law of demand, there is an inverse relationship between price and quantity demanded, other things remaining the same. The other things which are assumed to be constant are tastes and preferences of the consumer, the income of the consumer, prices of related commodities etc. Thus, the law of demand assumes that all things other than price remain constant.

The law of demand can be illustrated through a demand schedule and through demand curve. Demand schedule shows various quantities of good or service that people will buy at various possible prices during some specified period, while holding constant all other relevant economic variables on which demand depends. A demand schedule is presented below.:

Price	Quantity Demanded
10	20
8	40

6	60
4	80
2	100

We can convert the demand schedule into demand curve by graphically plotting the various price-quantity combinations, as shown below.



It is common practice in economics to measure price on vertical axis and quantity demanded per unit of time on the horizontal axis. Thus, the demand curve is a graph showing the various quantities of a good or service that the people will be willing and able to buy at various possible prices. Demand curve slopes downwards from left to the right. The downward sloping demand curve is in accordance with the law of demand, which describes inverse price-quantity demanded relationship. The various points on the demand curve represents alternative price -quantity combinations.

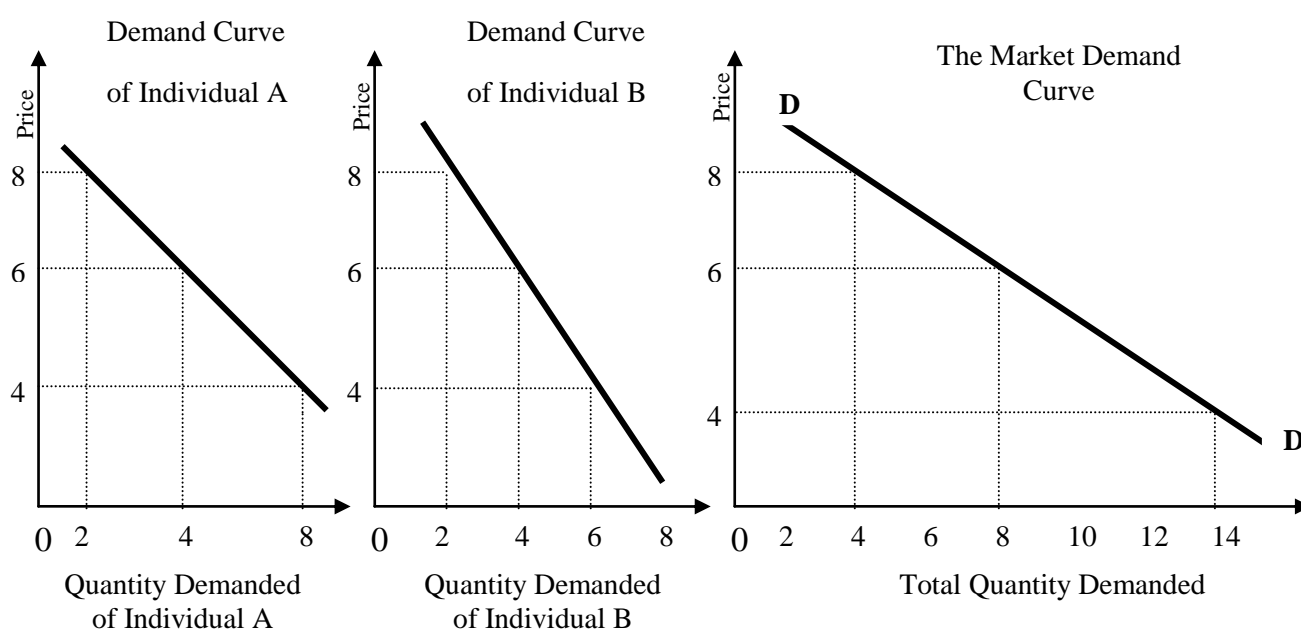
### **The Market Demand**

As mentioned above, the quantity of a product demanded by one individual depends on the product's price, other things being equal. To explain the market behaviour, we need to know the total demand of all individuals. The market demand for a commodity gives the alternative amounts of the commodity demanded at various prices by all individuals in the market during a period of time. To obtain the market demand, we sum the quantities demanded by each individual at a particular price to obtain the total quantity demanded at that price. We repeat the process for each price to obtain market demand schedule at all possible prices. The market demand for a commodity depends on the all the factors that determine the individual's demand. In addition, it also depends on the number of buyers of the commodity in the market. Geometrically, the market demand curve for a commodity is obtained by the horizontal summation of the entire individual's demand curve for the commodity.

For sake of simplicity, let us assume that there are only two individual consumers in the market, individual A and individual B. The individual demand schedules for these two consumers along with the market demand schedule is given below.

Individual A		Individual B		Market Demand	
Price	Quantity Demanded	Price	Quantity Demanded	Price	Quantity Demanded
8	2	8	2	8	4
6	4	6	4	6	8
4	8	4	6	4	14

At price Rs.8, individual A will buy 2 units and individual B will also buy 2 units. The total quantity demanded at Rs.8 is therefore 4 units. This is shown in the market demand schedule. Similarly, the total quantity demanded in the market at Rs.6 is 8 units and 14 units are demanded at Rs.4 in the market. It can be seen that the market demand schedule is the sum of the demands of the individual consumers in the market. A graph of this market demand schedule is called the market demand curve. The market demand curve is shown below



The above figure illustrates the proposition that the market demand curve is the horizontal sum of the demand curves of all the individuals who buy in the market. The market demand curve will also slope downwards from left to the right because the individual demand curves whose lateral summation gives the market demand curve normally slope downward from left to the right.

### Reasons for law of Demand

Let us analyse the reasons for the inverse relationship between price and quantity demanded. This is due to both “income effect” and “substitution effect”. When the price of the commodity falls, the



consumer can buy more quantity of the commodity with his given income. If he chooses to buy the same amount of the commodity as before, some money will be left with him. That is, consumer's real income or purchasing power increases. This increase in real income induces the consumer to buy more of the commodity. This is called the income effect of the change in price of the commodity. This is the reason why a consumer buys more of a commodity whose price falls. Similarly, an increase in the price of the commodity results in the reduction of real income of the consumer. Hence, the consumer buys less of a commodity whose price rises.

Again, when price of the commodity falls, it becomes relatively cheaper than other commodities. This induces the consumer to substitute the commodity whose price has fallen for other commodities which have now become relatively dearer. This change in quantity demanded resulting from substituting one commodity for another is referred to as substitution effect of the price change. As a result of this substitution effect, the quantity demanded of the commodity whose price has fallen rises. For normal commodities, the income and substitution effect of a price decline are positive and reinforce each other leading to a greater quantity demanded of the commodity.

Apart from the income effect and substitution effect, there is an additional reason why the market demand curve for a commodity slopes downwards. When the price of the commodity is relatively high, only few consumers can afford to buy it. When the price of the commodity falls, a greater number of consumers will be able to afford to buy it. In other words, the size of the market expands. Thus, the quantity demanded increases. This is called the "market size effect".

## **Exceptions to the Law of Demand**

Law of demand is generally believed to be valid in most situations. However, some exceptions have been pointed out. According to Thorstein Veblen, some consumers measure the utility of a commodity entirely by its price. That is, for them, the greater the price of the commodity, the greater it's utility. These consumers demand more of such commodities the more expensive these commodities are in order to impress people. E.g. Diamonds. This form of conspicuous consumption is called "Veblen effect". When the price of such commodities goes up, their prestige value also goes up. Consequently, quantity demanded also will rise and law of demand breaks down.

Another exception to the law of demand is the case of some inferior commodities and was pointed out by 19<sup>th</sup> century English economist Sir Robert Giffen. He introduced the case of some inferior goods in which there is a direct price-quantity demanded relationship. If the price of an inferior good falls, consumer's real income increases. So, instead of buying more inferior goods, consumers substitute other superior goods. In such case, quantity demanded of inferior goods falls as price falls. After the name of Robert Giffen, such goods are called "Giffen Goods". In the case of Giffen goods, positive substitution effect is smaller than negative income effect when the price of such goods falls. With the rise in the price of such goods, its quantity demanded increases and with the fall in the price, its quantity demanded decreases. Thus, the demand curve will slope upwards to the right and not downward in the case of Giffen goods. It should be noted that Giffen good is an inferior good but all inferior goods are not Giffen goods. Though occurs rarely in the real world, Giffen goods represent an exception to the law of demand.

## **Elasticity of Demand**

We have seen that the demand for a commodity is determined by its own price, income of the consumer, prices of related goods etc. Quantity demanded of a good will change as a result of a change in the size of any of these determinants of demand.

Elasticity measures the sensitivity of one variable to another. Specifically, it is a number that tells us the percentage change that will occur in the variable in response to one percent increase in another variable. Therefore, elasticity of demand refers to the sensitiveness or responsiveness of quantity

demand of a good to a change in its own price, income and prices of related goods. Accordingly, there are three kinds of elasticity of demand. They are

1. Price elasticity of demand
2. Income elasticity of demand
3. Cross elasticity of demand

Price elasticity of demand measures the sensitivity of quantity demanded to change in own price of a good. Income elasticity of demand measures the sensitivity of quantity demanded to change in income of the consumer. While cross elasticity of demand analyses the responsiveness of quantity demanded of one good to changes in the price of another good.

### Price elasticity of demand

Price elasticity of demand refers to the responsiveness or sensitiveness of quantity demanded of a good to changes in its own price. In order to have a measure of the responsiveness of quantity demanded of a good to change in its price that is independent of units of measurement, Alfred Marshall, defined in terms of percentage or relative change in quantity demanded to price. As such, price elasticity of demand is given by the percentage change quantity demanded of a good divided by the percentage change in its price. The elasticity is usually symbolised by Greek letter eta ( $\eta$ ). Thus, we have

$$\eta = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in price}}$$

Now denoting  $\Delta Q$  for change in quantity demanded and  $\Delta P$  for the change in price, we have the formula for the price elasticity of demand as;

$$\eta = \frac{\Delta Q/Q}{\Delta P/P}$$

That is,  $\eta = \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P}$

Or

$$\eta = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Since, price and quantity demanded are inversely related the coefficient of price elasticity of demand ( $\eta$ ) is a negative number. In order to avoid dealing with negative values, a minus sign is often introduced into the formula of price elasticity of demand. That is,

$$\eta = - \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Thus, price elasticity of demand is measured by a ratio; the percentage change in quantity demanded divided by the percentage change in the price that brought it about. For normal negatively sloped demand curves, price elasticity will be negative, but two Elasticities are compared by comparing their absolute values. As such, price elasticity of demand is a pure number that is it has no units of

measurement attached to it. This allows meaningful comparison between the price elasticity of demand of different commodities.

The above formula is called point elasticity formula of demand because it measures elasticity at a point on the demand curve. The value obtained for  $\eta$  is just a number like 2 or 5 or  $\frac{1}{2}$  and is referred to as the coefficient of elasticity. Since price elasticity is being measured at a point on the market demand curve we are assuming that all other factors that affect market demand remain fixed.

## Degrees of Price Elasticity of Demand

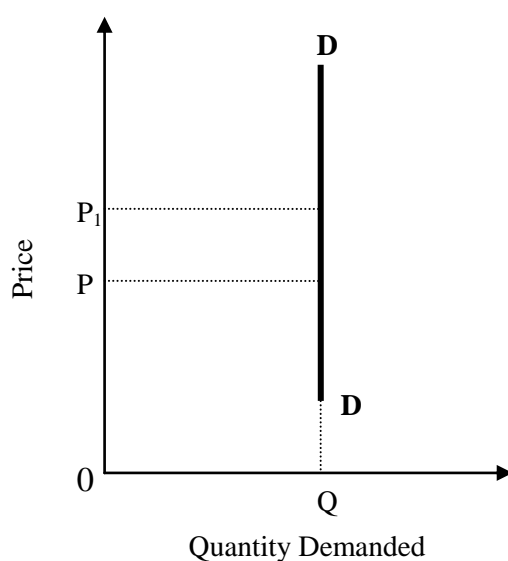
The value of price elasticity of demand ranges from zero to infinity. That is,  $0 \leq \eta \leq \infty$ . Based on the value of elasticity or degree of responsiveness of quantity demanded, price elasticity of demand is classified into five categories. They are

- 1) Perfectly inelastic demand
- 2) Inelastic demand
- 3) Unitary elastic demand
- 4) Elastic demand
- 5) Perfectly elastic demand

Now let us analyse each of them in detail.

### (1) Perfectly inelastic demand

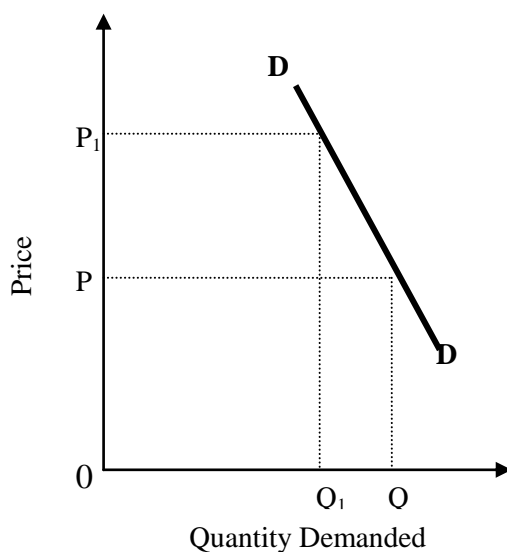
When quantity demanded does not change as a result of change in price, demand is said to be perfectly inelastic. Quantity demanded is unchanged when price changes or demand shows no response to change in price. In other words, same quantity will be bought whatever the price may be. Numerical value of elasticity will be zero ( $\eta = 0$ ) when there is perfectly or completely inelastic demand. The following figure illustrates the case of perfectly inelastic demand.



A change in price from  $P$  to  $P_1$  leaves quantity demanded unchanged at  $Q$  units. That is, quantity demanded does not change at all when price changes.

## (2) Inelastic Demand

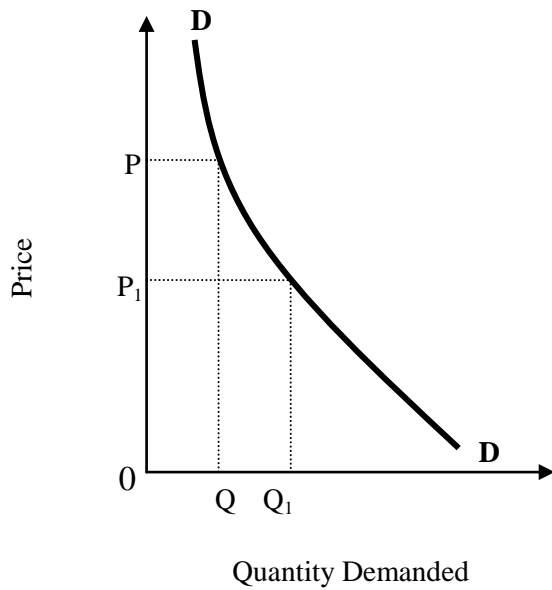
As long as there is some positive response of quantity demanded to change in price, the absolute value of elasticity will exceed zero. The greater the response, the larger the elasticity. However, when percentage change in quantity demanded is less than percentage change in price, demand is said to be inelastic. That is, a certain percentage change in price leads to a smaller percentage in quantity demanded. The coefficient of elasticity will be less than one but greater than zero ( $0 < \eta < 1$ ) when demand is inelastic. This is shown below.



When change in price from  $OP$  to  $OP_1$  causes a less than proportionate change in quantity demanded. That is, quantity demanded changes by a smaller percentage than the change in price.

## (3) Unitary Elastic Demand

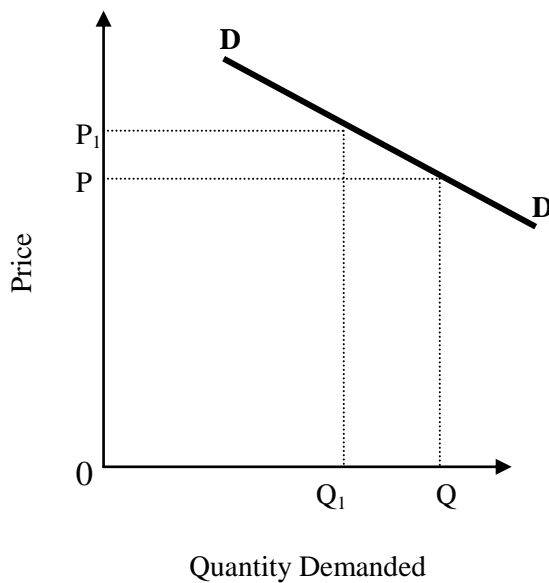
If a certain percentage change in price leads to an equal percentage change in quantity demanded, then demand is said to have unitary elasticity. Unitary elasticity is the boundary between elastic and inelastic demand. The coefficient of elasticity will be equal to one when demand is unitary elastic ( $\eta=1$ ). The demand curve having unitary elasticity over its whole range is shown below



OP and OQ are the initial price and quantity. A fall in price from OP to OP<sub>1</sub> causes an equal proportional change in quantity demanded from OQ to OQ<sub>1</sub>.

**Elastic Demand**

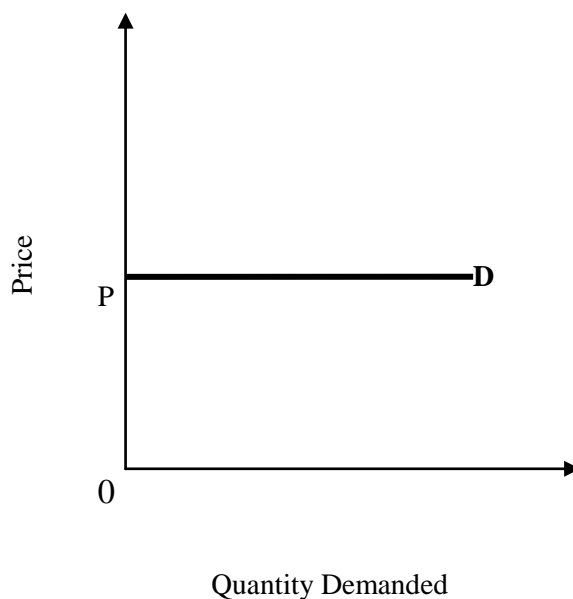
When the percentage change in quantity demanded exceeds the percentage change in price, the demand is said to be elastic. That is, a certain percentage change in price leads to a greater percentage change in quantity demanded. The value of coefficient of elasticity will be greater than one but less than infinity when demand is elastic ( $1 < \eta < \infty$ ). This is shown below.



An increase in price from  $OP$  to  $OP_1$  causes a more than proportionate increase in quantity demanded as shown by the change in quantity demanded from  $OQ$  to  $OQ_1$ . Thus, a small rise in price brings in more than proportionate fall in quantity demanded.

**(4) Perfectly Elastic demand**

If a small change in price leads to an infinitely large change in quantity demanded, we can say that demand is perfectly elastic. When demand is perfectly elastic, small price reduction will raise demand to infinity. At the same time, a slightest rise in price causes demand to fall to zero. At the going price, consumers will buy an infinite amount (if available).above this price, they will buy nothing. The coefficient of elasticity will be infinity when demand will be infinite when demand is perfectly elastic ( $\eta = \infty$ ). The graph for perfectly elastic demand is shown below.



When it is perfectly elastic, demand curve is a horizontal straight line. In his case an infinitely large amount can be sold at the going price  $OP$ . A small price increase from  $OP$  decreases quantity demanded from an infinitely large amount to zero (hyper sensitive demand).

The following table summarizes the terminology of price elasticity of demand.

Term	Numerical Measure of elasticity	Shape of the demand curve	Verbal description
Perfectly inelastic	Zero	Vertical (parallel to Y-axis that measures price)	Quantity demanded does not change an price changes

Inelastic	Greater than zero but less than one	Steeper	Quantity demanded changes by a smaller percentage than does price
Unitary elastic	One	Rectangular hyperbola	Quantity demanded changes exactly the same percentage as does price
Elastic	Greater than one but less than infinity	Flatter	Quantity demanded changes by a larger percentage than does price
Perfectly elastic	Infinity	Horizontal (parallel to X-axis that measures quantity)	Buyers are prepared to buy all they can at some price and none at all at higher prices.

## Income Elasticity of Demand

The responsiveness or sensitiveness of quantity demanded of a commodity to changes in income of the consumer is termed as income elasticity of demand. It is the proportionate or percentage change in quantity demanded resulting from proportionate change in income. Thus we have

$$\eta_y = \frac{\text{Percentage change in quantity demanded}}{\text{Percentage change in income}}$$

Percentage change in income

Now denoting  $\Delta Q$  for small change in quantity demanded and  $\Delta Y$  for the small change in income we may symbolically write the formula for the income elasticity of demand as

$$\eta_y = \frac{\Delta Q/Q}{\Delta Y/Y}$$

$$\text{That is, } \eta_y = \frac{\Delta Q}{Q} \cdot \frac{Y}{\Delta Y}$$

Or

$$\eta_y = \frac{\Delta Q}{\Delta Y} \cdot \frac{Y}{Q}$$

For the most commodities, increase in income leads to increase in quantity demanded. Therefore, income elasticity is positive. If the resulting percentage change in quantity demanded is larger than the percentage change in income, income elasticity will exceed unity ( $\eta_y > 1$ ). Then the commodity's demand is said to be income elastic. If the percentage change in quantity demanded is smaller than the percentage change in income, income elasticity will be less than unity ( $\eta_y < 1$ ). Then the commodity's demand is said to be income inelastic. If the percentage changes in income and quantity demanded are equal, income

elasticity will be unity ( $\eta_y = 1$ ). The commodity's demand is said to have unitary income elasticity of demand. Unitary income elasticity represents a useful dividing line.

There is also a relationship between income elasticity for a commodity and proportion of income spent on it. If the proportion of income spent on the commodity increases as income increases, then the income elasticity of demand for the commodity is greater than unity ( $\eta_y > 1$ ). If the proportion of income spent on the commodity decreases as income rises, then the income elasticity of demand for the commodity is less than unity ( $\eta_y < 1$ ). At the same time, if the proportion of income spent on the commodity remains the same as income rises, then the income elasticity of demand for the commodity is equal to unity ( $\eta_y = 1$ ).

If the commodity is normal, a rise in income causes more of it to be consumed. Other things being equal, this means a rightward shift in the commodity's demand curve. Thus, income elasticity will be positive for normal commodities. In the case of such commodities, an increase in income leads to an increase in quantity demanded. On the other hand, if the commodity is inferior, a rise in income causes less of it to be demanded. This implies a leftward shift in the commodity's demand curve. Thus income elasticity for inferior commodities will be negative. In the case of inferior commodities increase in income will lead to fall in quantity demanded. The boundary case between normal and inferior commodities occurs when a rise in income leaves quantity demanded unchanged so that income elasticity is zero. Zero income elasticity implies that quantity demanded of the commodity is quite unresponsive to changes in income. Zero income elasticity is significant because it represents a dividing line between positive income elasticity on one side and negative income elasticity on the other.

A normal commodity can be further classified as necessities and luxury using income elasticity. A commodity is considered as necessity if the income elasticity is less than unity. That is, in the case of necessities, the proportion of income spent on it falls as income rises. A commodity is considered to be luxury if its income elasticity is greater than unity. The proportion of consumer's income spent on luxuries rises as his income increases.

It should be said that, sometimes, the same commodity can be regarded as a luxury by some individuals or at some income levels and as a necessity or even as inferior commodity by other individuals or at other income levels. The terminology of income elasticity is summarised in the following table.

Type of Goods	Numerical Measure of Income elasticity	Verbal description
(1) Inferior Goods	Negative	Quantity demanded decreases as income increases
(2) Normal goods	Positive	Quantity demanded increases as income increases
2.1 Necessity	Less than one	Quantity demanded increases less than proportion to increase in income
2.2 Luxury	Greater than one	Quantity demanded increases more than proportion to increase in income



## Cross Elasticity of Demand

The responsiveness of quantity demanded of one commodity to changes in the prices of other commodities is often of considerable interest. The responsiveness or sensitiveness of quantity demanded of one commodity to the changes in the price of another commodity is called cross elasticity of demand. Thus, cross elasticity of demand can be defined as percentage or proportionate change in quantity demanded of commodity X resulting from a proportionate change in the price of commodity Y. The cross elasticity of commodity X with respect to the price of Y ( $\eta_{XY}$ ) can be presented as

$$\eta_{XY} = \frac{\text{Percentage change in quantity demanded of X}}{\text{Percentage change in price of Y}}$$

We may symbolically write the formula for the cross elasticity of demand as

$$\eta_{XY} = \frac{\Delta Q_X / Q_X}{\Delta P_Y / P_Y}$$

$$\Delta P_Y / P_Y$$

That is,  $\eta_{XY} = \frac{\Delta Q_X}{Q_X} \cdot \frac{P_Y}{\Delta P_Y}$

$$Q_X \quad \Delta P_Y$$

Or

$$\eta_{XY} = \frac{\Delta Q_X}{\Delta P_Y} \cdot \frac{P_Y}{Q_X}$$

$$\Delta P_Y \quad Q_X$$

Where  $\Delta Q_X$  is the change in quantity demanded of X,  $\Delta P_Y$  is the change in price of Y,  $P_Y$  is the original price of Y and  $Q_X$  is the original quantity of X. The coefficient of cross elasticity can vary from minus infinity to plus infinity. Substitute goods have positive cross elasticity and complementary goods have negative cross elasticity.

If  $\eta_{XY}$  is positive, the commodities X and Y are said to be substitutes. X and Y are substitutes if more of X is purchased when price of Y goes up. That is, an increase in  $P_Y$  leads to an increase in  $Q_X$  as X is substituted for Y in consumption. For example, consumers usually purchase more coffee when price of tea rises. Thus coffee and tea are substitutes or competing goods. In response to the rise in the price of one good, the demand for the other good rises.

On the other hand, if  $\eta_{XY}$  is negative, X and Y are said to be complementary goods. When X and Y are complementary goods, less of X will be purchased when the price of Y goes up. That is, an increase in  $P_Y$  leads to a reduction in  $Q_X$  (and  $Q_Y$ ). For example consumers usually purchase fewer scooters when the price of petrol goes up. Thus scooter and petrol are complements. Other examples of commodities that are complements are bread and butter, tea and sugar and so on. In the case of complements, a rise in the price of one good brings about a decrease in demand for the other, as they are consumed together.

If  $\eta_{XY}$  is zero, X and Y are independent commodities. A change in price of Y has no effect on the quantity demanded of X. This may be the case with cars and pencils, telephones and chewing gum and so on.

It should be noted that the value of  $\eta_{XY}$  is not equal to the value of  $\eta_{YX}$  since the responsiveness of  $Q_X$  to the change in  $P_Y$  need not be equal to the responsiveness of  $Q_Y$  to the change in  $P_X$ . For example, a change in the price of tea is likely to have a greater effect on the quantity of sugar (a complement of tea) demanded than the other way around, since tea is more important of the two in terms of total expenditure.

The concept of cross elasticity of demand is very significant in economic theory. The classification of commodities into substitutes and complementary is in terms of cross elasticity of demand. Again, a high positive cross elasticity of demand is often used to define an industry since it indicates that various commodities are similar. Besides we can also classify different market structures on the basis of cross elasticity of demand.

Following table summarises terminology of cross elasticity of demand

Type of goods	Numerical measure of cross elasticity	Verbal description
Substitutes	Positive	Quantity demanded of a good increases if the price of substitutes increases
Complementary	Negative	Quantity demanded of a good decreases if the price of complements increases
Independent	Zero	Quantity demanded of a good remains unchanged to change in the price of other good

Suggested Readings:

1. Dominick Salvatore ‘Microeconomic Theory’, Schuam’s Outline Series
2. A. Koutsoyannis : Modern Microeconomics, - Macmillan

### **Module III**

## **Theory of Supply**

Cost; cost function; opportunity cost; variable cost; fixed cost; total cost; marginal cost; average cost; supply; supply function; supply curve; Elasticity of supply and its types; Equilibrium price; market and its classification.

### **Nature of Cost of Production**

Production is the result of combined efforts of factors of production. The suppliers of factors of production should be paid a reward for participating in production. Cost of production is the sum total remuneration paid to owners of factors of production. Thus, cost may be defined as payments for the factors of production that the firm uses to produce goods and services. The value of inputs required in the production of a commodity determines its cost of output. The firm’s cost determines its supply. Supply along with the demand determines the price. To understand the process of price determination and the forces behind supply, we must understand the nature of costs.

### **Cost Function**

The cost function expresses a functional relationship between total cost and factors that determine it. Important factors that determine total cost of production of a firm are output, the level of technology, the prices of factors and fixed factors. But such comprehensive cost function requires a multidimensional analysis. Thus, usually cost function is shown as the functional relationship between cost and output. It is expressed as  $C = f(Q)$ , which means that the total cost (C) is a function (f) of output (Q), assuming all other determinants held constant.

### Costs in the Short Run: Fixed Cost and Variable Cost

The cost function is observed both in the short run and in the long run. The short run is the period of time in which output can be increased or decreased by changing only the amount of the variable factors such as labour and raw materials. In short run there factors such as capital, land whose quantities are fixed and cannot be varied to make changes in output. Therefore, the firm has some fixed cost and some variable cost in the short run. Thus, total cost (TC) in the short run consists of total fixed cost (TFC) and total variable cost (TVC). That is,

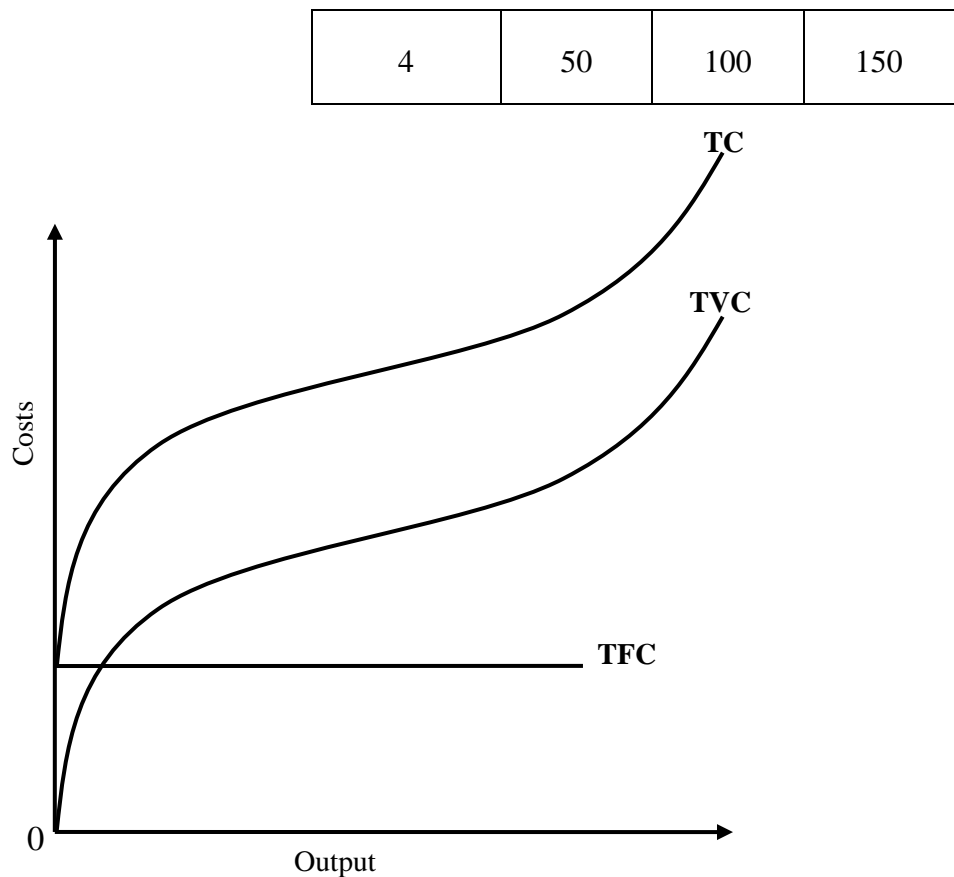
$$TC = TFC + TVC$$

Fixed costs are those which are independent of output. That is, they do not change with changes in output. It remains constant. They are independent of the level of output. In fact, fixed cost is incurred even when output is zero. Example: rent on building, interest on loan, salary to permanent staff. Fixed costs are also called as supplementary or over head costs or indirect costs.

Variable costs, on the other hand, are those costs which are incurred on the employment of variable factors whose amount can be varied in the short run. Variable costs directly vary with the size of output. It increases with the increase in output. It decreases with the decrease in output. Variable costs are made only when some amount of output is produced. That is, when output is zero variable cost is also zero. Example: wages, raw material charges. Variable costs are called prime costs or direct costs.

The concept of total cost, total fixed cost and total variable cost is illustrated in the following table and figure.

<i>No of units of output</i>	<i>TFC</i>	<i>TVC</i>	<i>TC</i>
0	50	0	50
1	50	20	70
2	50	35	85
3	50	60	110



Since total fixed cost remains constant whatever the level of output, TFC curve is parallel to output axis. TVC rises upwards showing that as the output is increased, TVC also increases. TVC curve has an inverted S shape and starts from the point of origin because when output is zero the TVC also is zero. TC curve has been obtained by adding up vertically TFC and TVC. The TC curve is a continuous curve which shows that with increasing output total costs also increase

### Average Cost and Marginal Cost

The average cost (AC) or average total cost (ATC) is the total cost divided by the number of units produced. Thus,  $AC \text{ or } ATC = TC/Q$ . Since, total cost is the sum of TFC and TVC, average cost is also sum of average fixed cost and average variable cost.

$$\text{Thus, } TC = TFC + TVC$$

$$AC = TC/Q = TFC/Q + TVC/Q$$

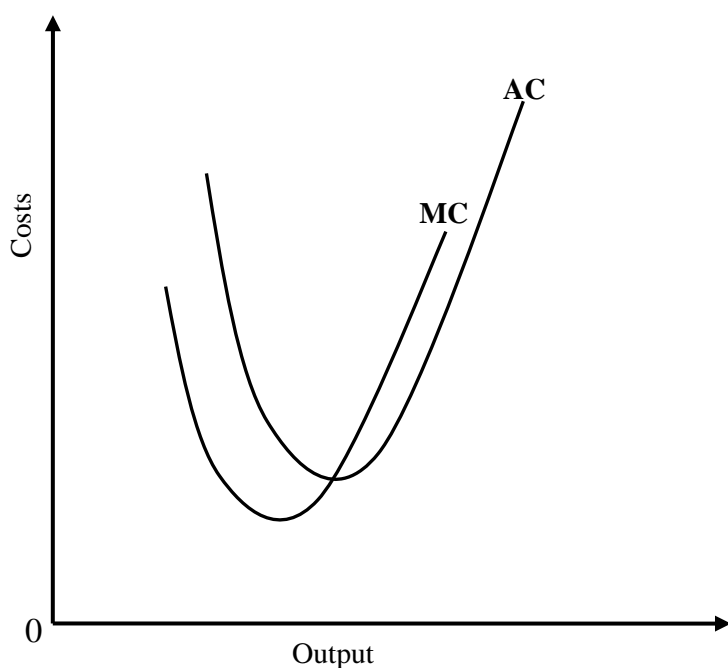
$$\text{That is, } AC = AFC + AVC$$

Average cost is also called unit cost since it is cost per unit of output is produced. The behaviour of average cost will depend upon the behaviour of average fixed cost and average variable cost. At first average cost is high because both AFC and AVC are high at low levels of output. As output increases AC fall sharply because of the steady decline in both AFC and AVC. As output is beyond the optimum point, AC rises because the fall in AFC is negligible in relation to the rising AVC. Thus, AC will be U-shaped.

Marginal cost (MC) is the addition to the total cost caused by producing one more unit of output. Thus MC is the extra or additional cost incurred by producing an additional unit of output. Since MC is a change in total cost as a result of a unit change in output, it can also be written as  $MC = \Delta TC / \Delta Q$ . Algebraically, it is the total cost of N units minus the total cost of N-1 units of output. That is  $MC_N = TC_N - TC_{N-1}$ . The marginal cost also first fall and then rise and have U-shape.

The relationship between marginal cost and average cost is explained in the following table and figure.

No of units of output	TC	AC	MC
1	30	30	30
2	57	28.5	27
3	81	27	24
4	100	25	19
5	125	25	25
6	162	27	37
7	210	30	48



The relationship between the marginal cost and average cost is stated below

- Both MC and AC are U shaped
- When MC is less than AC, AC falls
- When MC is greater than AC, AC rises
- MC cuts AC at its lowest point

## Opportunity Cost

The concept of opportunity cost occupies a very important place in modern economic analysis. The opportunity cost of a given commodity is the next best alternative sacrificed in order to obtain the given commodity. According to Jeremy Bentham “the opportunity cost of anything is the next best alternative that could be produced instead by the same factors or equivalent group of factors, costing the same amount of money”. Thus, the opportunity cost is the cost of the opportunity missed or the alternative foregone.

It should be noted that the opportunity cost of a commodity is not any alternative commodity that could be produced; it is only the most valuable other commodity which the same factors could produce. The concept of opportunity cost has wide application in economic problems. It is the opportunity cost which explains the phenomenon of price. Since there is scarcity of goods and factor services, they are put into alternative uses and thus command a price. If they were unlimited, there would be no alternative foregone, no opportunity costs and no price.

## Nature of Supply

Supply refers to the various quantities of a good or service that sellers will be able to offer for sale at various prices during a period of time. It shows how price of a good or service is related to the quantity which the sellers are willing and able to make available in the market. As in the case of demand, supply refers not to a specific quantity that will be sold at some particular price, but to a series of quantities and a range of associated prices. Supply is a desired flow. That is, it shows how much firms are willing to sell per period of time, not how much they actually sell.

## Supply Function

Like demand, supply also depends on many things. In general, quantity supplied of a product is expected to depend on own price, prices of related products, prices of inputs, state of technology, expectations, number of producers (sellers) in the market etc. This list can be summarised in a supply function

$$Q_x^S = f(P_x, P_r, P_i, T, E, N)$$

Where,

$Q_x^S$  = Quantity supplied of commodity x

$P_x$  = Price of the commodity x

$P_r$  = Prices of related products

$P_i$  = Prices of inputs

T = State of technology

E = Expectations

N = Number of producers in the market

For a simple theory of price, we need to know how quantity supplied varies with the product's own price, all other things being held constant. Thus we can write the supply function as;

$$Q_x^S = f(P_x)$$

That is, quantity supplied of commodity x is a function of its own price, other determinants are assumed to remain constant.

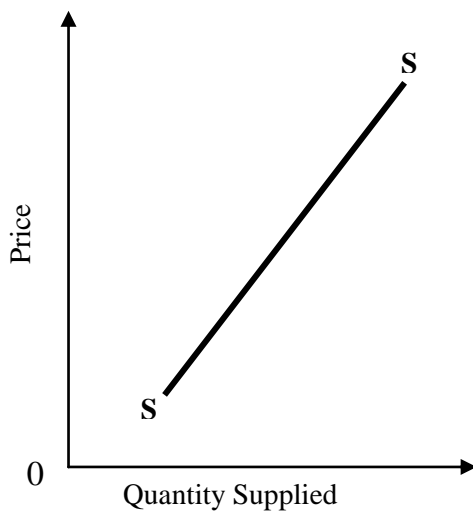
### **Law of Supply**

The functional relationship between price and quantity supplied is called the law of supply. According to the law of supply, as the price of the commodity falls, the quantity supplied decreases or alternatively, as the price of the commodity rises the quantity supplied increases, other things being equal. Therefore, there is a direct relationship between of the commodity and quantity supplied.

The law of supply can be illustrated through a supply schedule and supply curve. Supply schedule is a table that shows various quantities of a good or service that sellers are willing and able to offer for sale at various possible prices during some specified period. A supply schedule is presented below

Price	Quantity Supplied
5	40
10	60
15	80
20	100
25	120

Supply schedule shows that as price rises, a greater quantity is offered for sale. By plotting the information contained in the supply schedule on a graph we can derive the supply curve as shown below.



The supply curve is a graph showing various quantities of a good or service that sellers are willing and able to offer for sale at various possible prices. The supply curve slopes upwards because of the direct relationship between price and quantity supplied. Note that the entire supply curve represents supply while a point on the supply curve represents quantity supplied at some specific price.

Why there is a direct relationship between price and quantity supplied? The main reason is that higher prices serve as an incentive for sellers to offer greater quantity for sale. The sellers or producers can be induced to produce and offer a greater quantity for sale by higher prices. It is assumed that sellers or producers aim to maximise profit from the production and sale of the commodity. The higher the prices of the commodity, other things being equal, the greater the potential gain producers can expect from producing and supplying it in the market. Moreover, increases in price may invite new suppliers in the market.

### **Elasticity of Supply**

The concept of elasticity of supply closely parallels that of elasticity of demand. Though quantity supplied is influenced by a number of factors, we will focus on the commodity's own price as a factor influencing supply. That is, we will be concerned with price elasticity of supply.

Price elasticity of supply measures the responsiveness or sensitiveness of quantity supplied of a commodity to a change in its price. It is given by the percentage change in the quantity supplied of a commodity divided by the percentage change in price. Letting  $\epsilon$  (Greek letter epsilon) stand for the coefficient of price elasticity of supply, we have,

$$\epsilon = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}}$$

Being expressed in terms of relative or percentage changes, the price elasticity of supply is a pure number. That is, it has no units attached to it. The value of price elasticity of supply does not change



when the units of measurement are changed. This allows meaningful comparisons in the price elasticity of supply of different commodities.

Using the point elasticity formula,

$$\epsilon = \frac{\Delta Q/Q}{\Delta P/P}$$

That is,

$$\epsilon = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

Where  $\Delta Q$  represents change in the quantity supplied and  $\Delta P$  represents change in price. Since quantity supplied and price move in the same direction, supply curves normally have positive slope. Therefore, supply elasticity is normally positive. It will be anything between zero and infinity ( $0 \leq \epsilon \leq \infty$ ).

### Types of Supply Elasticity

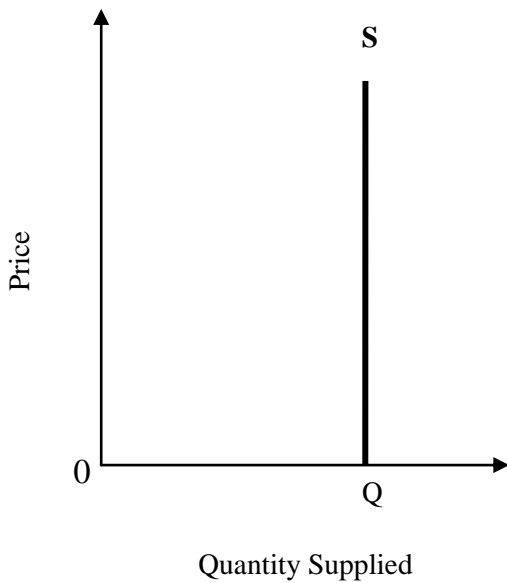
When the supply curve is upward sloping, the elasticity of supply will be anything between zero and infinity. On the basis of the value of the coefficient of elasticity of supply we can classify it into the following five categories

- (1) Perfectly inelastic supply
- (2) Inelastic supply
- (3) Unitary elastic supply
- (4) Elastic supply
- (5) Perfectly elastic supply

Let us each one of them in detail

#### (1) Perfectly Inelastic Supply

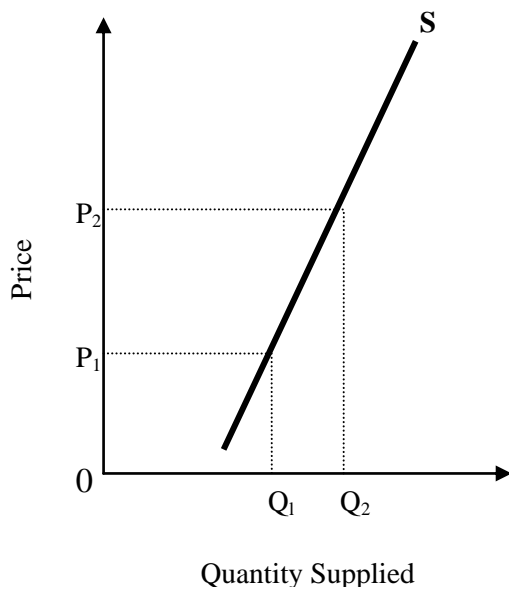
When the quantity supplied of a commodity does not change at all in response to the change in price, elasticity of supply is said to be perfectly inelastic. This is the case of zero elasticity ( $\epsilon = 0$ ) and the supply curve will be vertical straight line, as shown below.



The supply curve has zero elasticity since the same quantity  $Q$  is supplied whatever the price.

**(2) Inelastic Supply**

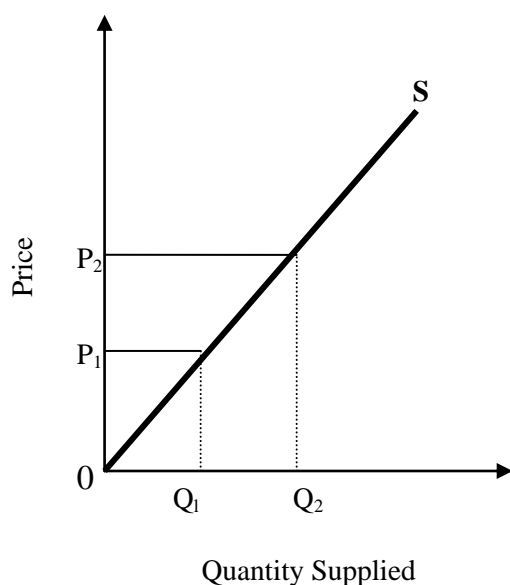
If the percentage change in quantity supplied is smaller than the percentage change in price, supply is said to be inelastic. The value of the coefficient of supply will be greater than zero but less than unity ( $0 < \epsilon < 1$ ). If a linear supply curve crosses or cuts the horizontal (quantity) axis, supply is inelastic, as shown below.



A change in price from  $P_1$  to  $P_2$  causes less than proportional change in quantity supplied from  $Q_1$  to  $Q_2$ .

**(3) Unitary Elastic Supply**

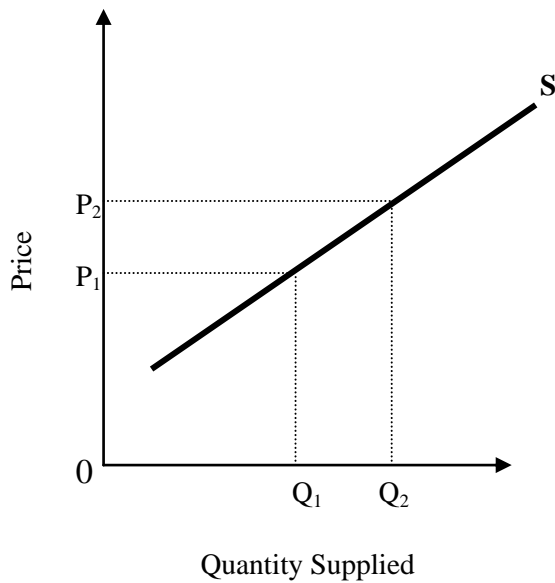
If the percentage change in quantity supplied is equal to percentage change in price, supply is said to be unitary elastic. The value of coefficient of elasticity will be equal to one ( $\epsilon = 1$ ) when supply is unitary elastic. If linear supply curve passes through the origin, supply is unitary elastic regardless of its scope. This is illustrated below.



The figure shows that any straight line has a unitary elasticity indicating that the percentage change in quantity equals the percentage change in price between any two points on the curve.

#### (4) Elastic Supply

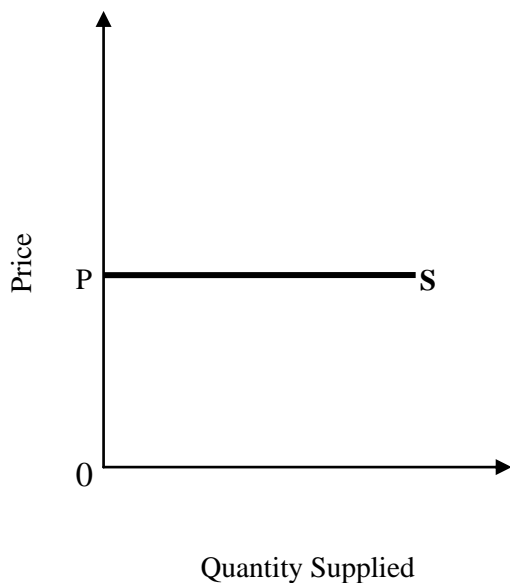
If the percentage change in quantity supplied is greater than percentage change in price, supply is said to be elastic. The value of the coefficient of elasticity will be greater than unity ( $1 < \epsilon < \infty$ ) when the supply is elastic. A linear supply curve indicates an elastic supply if it cuts the vertical (price) axis



An increase in price from P<sub>1</sub> to P<sub>2</sub> causes more than proportionate increase in quantity supplied from Q<sub>1</sub> to Q<sub>2</sub>.

**(5) Perfectly Elastic Supply**

At any given price infinite quantity is supplied, supply is said to be perfectly elastic. The coefficient of elasticity will be infinity ( $\epsilon = \infty$ ) when supply is perfectly elastic. Perfectly elastic supply curve is depicted by a horizontal supply curve parallel to quantity axis.



The supply curve has infinite elasticity at price OP. Nothing at all will be supplied at price below OP, while an infinitely large quantity will be supplied at price OP.

## Market Equilibrium

The market equilibrium occurs when the prevailing price equates quantity demanded to quantity supplied. It refers to the price-quantity pair at which this takes place. Consumers bring demand to the market for buying goods to satisfy their wants. Producers or sellers bring supply of their goods to the market to sell them and earn profit. The market demand and supply determine prices of goods and services exchanged between buyers and sellers. Thus, market equilibrium is reached when market demand for and market supply of a good are equal and as a result, equilibrium prices and equilibrium quantities are determined. At such equilibrium, buyers find that they are able to buy exactly the same amount that they are demanding at the prevailing price and sellers are able to sell exactly the amount they are willing to supply at the prevailing price. In other words, there is no incentive for anyone in the market to change their behaviour. Thus equilibrium is the condition, which once achieved tends to persist in time.

By bringing together the market demand and supply schedules we can see how market forces determine equilibrium price and quantity of the good. The following table presents a hypothetical demand and supply schedules of commodity X.

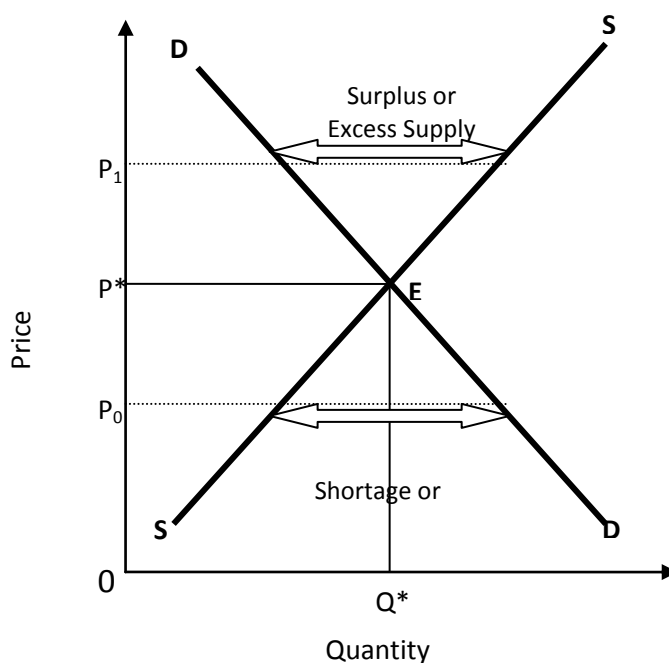
Price of commodity X ( $P_X$ in Rupees)	Quantity Supplied ( $Q_X^S$ )	Quantity Demanded ( $Q_X^D$ )	Surplus (+) Shortage(-)	Pressure on Price
5	140	20	120	Downward
4	100	40	60	Downward
3	60	60	0	Equilibrium
2	40	80	-40	Upward
1	20	100	-80	Upward

When the price of commodity X is Rs.1, buyers are willing and able to purchase 100 units but sellers are willing and able to offer only 20 units for sale. Therefore, there is a shortage of 80 units. At price of Rs.5, buyers are willing and able to purchase only 20 units while sellers are willing to offer 140 units. Therefore, there will be a surplus of 120 units in the market. Let us now consider a price of Rs.3. At this price, buyers are willing to purchase 60 units and sellers are willing to offer 60 units for sale. That is, at this price, there is neither a surplus nor a shortage. Quantity supplied of commodity is equal to the quantity demanded. Thus  $P_X = \text{Rs.}3$  is the equilibrium price and  $Q_X^S = Q_X^D = 60$  is the equilibrium quantity.

At any other price other than the equilibrium price of Rs = 3, market forces are set in motion to raise or lower the price. At the prices above the equilibrium price, the quantity supplied exceeds the quantity demanded. For example, at  $P_X = \text{Rs } 4$ , sellers are willing to put 100 units of commodity X on the market but buyers are willing to take only 40 units. There will be surplus or excess quantity supplied of the commodity. Then the sellers will attempt to dispose this surplus by lowering the price. As price falls, a greater quantity will be demanded. At lower prices sellers supply smaller quantities and buyers demand larger quantities until the equilibrium price of Rs 3 is reached, at which the quantity supplied of 60 units of commodity X equals the quantity demanded and market clears.

On the other hand, at prices below the equilibrium price, the quantity supplied fall short of quantity demanded. For example, at  $P_X = \text{Rs.}2$ , buyers are willing to purchase 80 units but sellers will be able to offer only 40 units. There is a shortage or excess quantity demanded. Unhappy with the shortage, and wanting more commodity X, buyers will bid up the price to induce sellers to supply them the desired amount. Then the sellers offer a greater quantity at higher prices. The price will again settle at  $P_X = \text{Rs.}3$ , because at this price, the quantity demanded equals quantity supplied. Note that, price of Rs.3 is the only price that will prevail in the market. There will be no tendency of this price to change. Such a price is referred to as equilibrium price and quantity traded or exchanged at this price is called equilibrium quantity. The market for the product is said to be in equilibrium when the quantity demanded equals the quantity supplied at a specific price.

The determination of equilibrium price and quantity can also be shown graphically by bringing together the market demand and market supply curve on the same graph, as shown below.



The intersection of market demand curve DD and market supply curve SS at point E defines the equilibrium price  $P^*$  and the equilibrium quantity  $Q^*$ . At the equilibrium price, quantity demanded is equal to the quantity supplied. Because there is no excess demand or excess supply there is no pressure for the price to change further.

As said above, the equilibrium between demand and supply is not reached at once. There is the process of changes and adjustments which ultimately results in equilibrium price and quantity. Suppose that price is above the equilibrium level, say at  $P_1$ . At such higher price, there is excess supply or surplus of the commodity. Then the sellers would begin to lower prices in order to sell their excess suppliers. This surplus is eliminated as prices fall, quantity demanded increases and quantity supplied would decrease until the equilibrium price  $P^*$  is reached, at which quantity demanded = quantity supplied. The opposite will happen if the price is below the equilibrium price, say at  $P_0$ . There will be excess demand or shortage. Consumers are unable to purchase the entire commodity they want at below-equilibrium prices and they bid up the price. This would put upward pressure on price and quantity supplied increases and until price eventually reach the equilibrium price  $P^*$ , and the market clears.

Thus, through the process of adjustment in price and quantity, eventually equilibrium price and quantity are determined at which quantity demanded and supplied are equal. As long as demand and supply do not change, the equilibrium point remains the same. But it should be noted that, at a particular point in time, the observed market price may or may not be the equilibrium price. All we know is that market forces always push the market price towards the equilibrium price when they are not equal. We can also assume that, in the absence of price controls, the market price is the equilibrium price.

## The Market Structures

A market is a network of communications between individuals and firms for the purpose of buying and selling of goods and services. A market can, but need not, be a specific place or location where buyers and sellers actually come face to face for the purpose of transacting their business. That is, the idea of a particular locality or geographical place is not necessary to the concept of market. What is required for the market to exist is the contact between sellers and buyers so that transaction at an agreed price can take place between them.

The popular basis of classifying market structures rests on three elements, namely, the number firms producing the product, the nature of the product and the conditions of entry into and exit from the market. The market can be classified in the following ways.

1. Perfect competition
2. Monopoly
3. Monopolistic competition
4. Oligopoly

Now let us examine each of the market structure in detail

### Perfect Competition

Perfect competition is the market structure that fulfils the following conditions or assumptions.

1. Large number of buyers and sellers

The market includes large number of buyers and sellers so that no individual buyer or seller can influence the existing market price of the commodity. Each buyer buys a insignificant quantity and each seller sells an insignificant part of the total quantity bought and sold. Thus the seller or firm is price taker.

2. Homogeneous Product

The industry is defined as a group of firms producing a homogeneous product. The technical characteristics of the product as well as services associated with its sale and delivery are identical. There is no way in which a buyer could differentiate among the products of different firms

3. Free and exit of firms

There is no barrier to entry and exit from the industry. Firms have freedom of movement in and out of the industry

4. Profit Maximisation

The goal of all firms is profit maximisation. No other goals are pursued.

5. No Government regulation

There is no government intervention in the market. Tariffs, subsidies etc are ruled out.

The market structure in which the above assumptions are fulfilled is called *pure competition*. It is different from perfect competition, which requires the fulfillment of the following two additional assumptions.

6. Perfect mobility of factors of production

The factors of production are free to move from one firm to another. Workers can move between different jobs. Raw materials and other factors are not monopolized and labour is not unionized.

7. Perfect knowledge

Buyers and sellers have complete knowledge of the conditions in the market. They have perfect knowledge about the prices at which goods are bought and sold. Therefore, advertisement becomes unnecessary and so there is no selling cost.

## Monopoly

Literally monopoly means one seller. 'Mono' means one and 'poly' means seller. Monopoly is said to exist when one firm is the sole producer or seller of a product which has no close substitutes. Thus monopoly is negation of competition. The following are important features of monopoly.

1. There is a single producer or seller of the product. Entire supply of the product comes from this single seller. There is no distinction between a firm and an industry in a monopoly. The firm and industry are identical in monopoly.



2. There is no close substitute for the product. If there are some other firms which are producing close substitutes for the product in question there will be competition between them. In the presence of competition a firm cannot be said to have monopoly. Monopoly implies absence of all competition.
3. There is no freedom of entry. The monopolist erects strong barriers to prevent the entry of new firms. The barriers which prevent the firms to enter the industry may be economic or institutional or artificial in nature. In the case of monopoly, the barriers are so strong that prevent entry of all firms except the one which is already in the field.
4. The monopolist is a price maker. But in order to sell more a monopolist had to reduce the price. He cannot sell more units at the existing price.
5. The monopolist aims at maximisation of his profit.

### **Monopolistic Competition**

Perfect competition and monopoly are rarely found in the real world and thus they do not represent the actual market situation. Economists often use the term imperfect competition to refer to a market structure that is neither purely competitive nor purely monopolistic. Two forms of imperfect competition are monopolistic competition and oligopoly.

As the name implies, monopolistic competition contains the element of both pure competition and monopoly. Monopolistic competition may be defined as a market structure where there are many sellers who sell differentiated products. Each producer under monopolistic competition enjoys some degree of monopoly and at the same time faces competition. The following are important features of monopolistic competition.

#### 1. Large number of sellers

The market consists of relatively large number of sellers or firms each satisfying a small share of the market demand for the commodity. Unlike perfect competition, these large numbers of firms do not produce homogeneous products. Instead they produce and sell differentiated products which are close substitutes of each other. Thus there is stiff competition between them.

#### 2. Product Differentiation

Product differentiation is a key feature of monopolistic competition. Product differentiation is a situation in which firms use number of devices to distinguish their products from those of other firms in the same industry. Products produced by the firms are close substitutes of each other. Products are not identical but are slightly different from each other.

#### 3. Non price competition: Selling cost

Firms incur considerable expenditure on advertisement and other selling costs to promote the sales of their products. Promoting sales of their products through advertisement is an important example of non-price competition. The expenditure incurred on advertisement is prominent among the various types of selling costs

4. Freedom of entry and exit

In a monopolistically competitive industry, it is easy for new firms to enter and the existing firms to leave it. Firms will enter in to the industry attracted by super normal profit of existing firms and existing firms will leave industry if they are making losses. However entry may not be as easy as in perfect competition because of the need to differentiate one's product in a monopolistically competitive market.

5. There is absence of perfect knowledge. That is buyers and sellers do not have perfect knowledge about market conditions

6. There is no uniform price. Different producers charge different prices for their products because products are differentiated in some way.

## **Oligopoly**

Oligopoly is said to prevail when there are few firms or sellers in the market producing or selling a product. Oligopoly is often referred to as "competition among the few". The simplest case of oligopoly is duopoly which prevails when there are only two producers or sellers of the product. The following are important features of oligopoly

1. Few firms

The market consists of only a few firms. When there are two or more than two, but not many, oligopoly is said to exist. Each produces a relatively large share of the industry

2. Interdependence

There is interdependence in decision making of the few firms which comprise the industry. This is because when number of competitors is few, any change in price, output etc by a firm will have a direct effect on the fortune of its rival.

3. Selling cost

A direct effect of interdependence of monopolist is that the various firms have to employ various aggressive and defensive marketing weapons to gain a greater share in the market or to prevent a fall in the share. For this firms have to incur a good deal of costs on advertisement and other measures of sales promotion.

4. Group behaviour

The theory of oligopoly is a theory of group behaviour. There are few firms in the group which are very much interdependent. Each firm considers not only the market demand but also the reaction of the other firms when any decisions or actions are taken

#### 5. Indeterminateness of demand curve

Another important feature of oligopoly is the indeterminateness of demand curve. This is because of interdependence of firms in the market. Under oligopoly, a firm cannot assume that its rival will keep their prices unchanged when it make changes in its own price. As a result of this, the demand curve facing an oligopolistic firm loses its definiteness and determinateness.

#### Suggested Readings:

1. Dominick Salvatore 'Microeconomic Theory', Schuam's Outline Series
2. A. Koutsoyannis : Modern Microeconomics, - Macmillan

## Module IV

# Theory of Production

Production Function-Types of production function (short run and long run)- Economies of scale

### Theory of Production

This chapter examines the theory of production or how firms combine resources or inputs to produce final commodities. This chapter begins with a discussion of the organization of production. We define the meaning of production, examine why firms exist, consider their aims, classify resources or inputs into various categories, define the meaning of short-run and long-run production and the meaning of economies of scale.

### Organization of Production

**Production** refers to the transformation of resources/inputs into outputs of goods and services. For example, General Motors hires workers who use machinery in factories to transform steel, plastic, glass, rubber, and so on into automobiles. The output of a firm can either be a final commodity such as automobiles or an intermediate product such as steel (which is used in the production of automobiles and other goods). The output can also be a service rather than a good. Examples of services are education, medicine, banking, legal counsel, accounting work, communications, transportation, storage, wholesaling, and retailing.

Production is a flow concept or has a time dimension. In other words, production refers to the rate of output over a given period of time. This is to be distinguished from the stock of a commodity or input, which refers to the quantity of the commodity or input at hand or available at a particular point of time.

In the world most of the goods and services consumed are produced by firms. The remainder is produced by the government and such nonprofit organizations such as the Red Cross, private colleges, co-operative societies, etc. A **firm** is an organization that combines and organizes resources for the purpose of producing goods and services for sale at a profit. There may be millions of firms in a country. These include proprietorships (firms owned by one individual), partnerships (owned by two or more individuals) and corporations (owned by stockholders).

Just as consumers seek to maximize utility or satisfaction, firms generally seek to maximize profits. Profits refer to the revenue of the firm from the sale of the output after all costs have been deducted. Costs include not only the actual wages paid to hired workers and payments for purchasing other inputs, but also the income that the owner of the firm would earn by working for someone else and the return that he or she would receive from investing his or her capital in the best alternative use.

### Classification of inputs

Firms transform inputs into outputs. **Inputs**, resources, or factors of production are the means of producing the goods and services demanded by society. Inputs can be classified broadly into **labour or human resources**(including entrepreneurial talent), **capital or investment goods**, and **land or natural resources**.

Inputs can further classified into fixed and variable. **Fixed inputs** are those that cannot be varied or can be varied only with excessive cost during the time period under consideration. Examples of fixed inputs are the firm's plant and specialized equipment. **Variable inputs**, on the other hand, are those that can be varied easily and on short notice during the time period under consideration. Raw materials and many types of workers, particularly those with low levels of skills are examples of variable factors/inputs.

The time period during which at least one input is fixed is called **short run**, and the time period during which all inputs are variable is called the **long run**. Obviously, the length of time it takes to vary all inputs varies for firms in different industries. For a street vendor of apples, the long run may be a day. For an apple farmer, it is at least five years.

Before explaining the production function it is better to explain the concepts of Total Product, Average Product and Marginal Product. **Total Product** refers to the total volume of goods and services produced by a firm. It is the total physical output corresponding to each set of inputs. **Average Product** is the product per unit of variable factor. It can be obtained by dividing the total product by the number of units of the variable factor.

$$AP = \frac{TP}{\text{No of units of variable factor}} \quad \text{or} \quad \frac{TP}{L}$$

Here 'L' = value of the units of labour

Marginal Product is the additional product received by the firm due to the employment of an additional unit of the variable factor. It is the addition to the total product when one more factor input is used. It is also defined as the rate of change in Total product per unit change in the variable factor.

$$MP = \frac{\Delta TP}{\Delta L}$$

Where, MP = The marginal Product

$\Delta TP$  = Change in total product

$\Delta L$  = Change in Labour

## Production Function

Production function expresses the relationship between inputs outputs. It refers to how much output can be produced with a given level of input. The output of a firm can change with the change in inputs. Thus production function expresses the functional relationship between physical inputs and physical outputs. It can be represented by a table, a graph, or an equation and shows the maximum output of a commodity that can be produced per period of time with each set of inputs.

It can be written as;

$$Q = f [F_1, F_2, \dots, F_n]$$

Where 'Q' is physical amount of a certain product, and

F<sub>1</sub>, F<sub>2</sub>,-----F<sub>n</sub> stand for various inputs needed to produce 'Q'

## Types of production function

It may be noted that to increase the physical quantity of 'Q' we will have to increase all factor inputs or some of the factor inputs. Whether the firm can increase all factor inputs or only one of these depends on the time period – that is, short period or the long period. **Short period** is the period in which supplies of certain inputs are fixed while others are variable. Therefore, the firm can increase output only by changing the variable factors.

In the **long period** supplies of all inputs are variable. Therefore, the firm can increase output by changing all factors in the long run. Among the various forms of production function we are mainly concerned with the two qualitative forms of production function. They are:

### I. Fixed proportion production function

Under fixed proportion we study input output relation where the application of all factors is varied and proportion in which various factor inputs are combined remains the same. Production function based on fixed proportion deals with the returns to scale. It explains the '*Law of Returns to Scale*'.

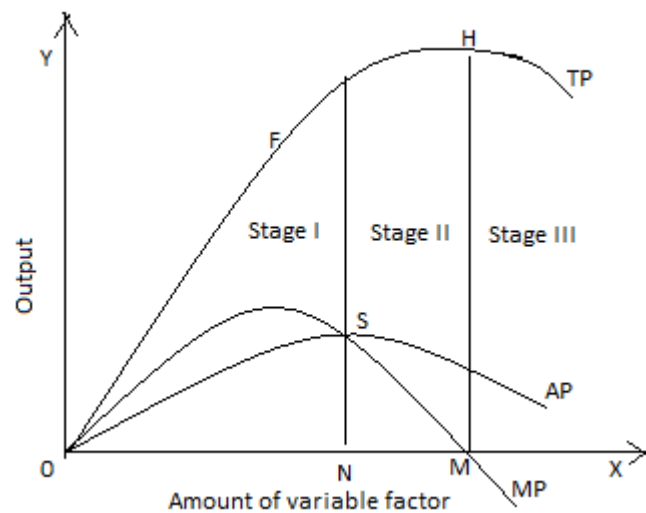
### II. Variable proportions production function

In the variable proportions, we study the production function when the application of a single factor is varied, while the application of all other factors is unchanged. Then the proportion in which the various factor inputs are combined changes. Production function based on variable proportions deals with the returns to a factor and explains the '*Law of Variable Proportions*'.

## The Law of Variable Proportions

The law of variable proportions is the new name for the famous 'Law of Diminishing Returns' of the classical school. To be more precise, the law of variable proportions is a statement of more general tendency than that of the Law of Diminishing Returns which focuses on the second stage of production. The Law of Variable Proportions cover all the stages of production. It deals with three stages of relations between inputs and output.

The Law states that "When more and more units of variable factor are combined with fixed quantities of other factors, the increase in total production after a point, become smaller and smaller". That is, as the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish. Thus there are three stages showing three different situations of returns as depicted below. In the figure TP is the total product curve, MP is the marginal product curve and AP is the average product curve.



### Stage I

This is the stage of increasing returns. Here total product (TP) is increasing up to the point F at increasing rate. After this point, TP is increasing at a diminishing rate. It is because Marginal Product Curve (MP) increases up to the point F and then it falls. The point F is called *the point of inflection*.

### Stage II

This is the stage of diminishing returns. Here the TP continue to increase at a diminishing rate until it reaches its maximum at point H, where the second stage ends. In this stage both MP and AP are diminishing but still they are positive. At this stage TP reaches its maximum point H when MP is equal to zero. This stage is very crucial because it shows the maximum range upto which production can be undertaken.

### Stage III

This is the stage of negative returns. Here TP begins to fall because MP goes below the X axis showing negative returns.

A rational producer will always seek to select the second stage since the first and the third ones are non-economical stages. The law of variable proportions is relevant only in the short run. In the long run it may not happen so.

The following points about the diagram need special attention.

- When MP is greater than AP, AP rises.
- When AP and MP become equal, AP is at the maximum.
- When MP becomes less than AP, AP falls.
- When MP is equal to zero, TP is at the maximum.
- MP is the maximum at the point of inflection of TP.

## Returns to scale

Returns to scale refers to the long-run production function. It represents the changes in output when all factors or inputs in a particular production function are changed proportionately. In the long run all inputs are variable. So returns to scale refers to change in output as a result of change in all factors in the same proportion.

There are three types of returns to scale.

### 1. Increasing returns to scale

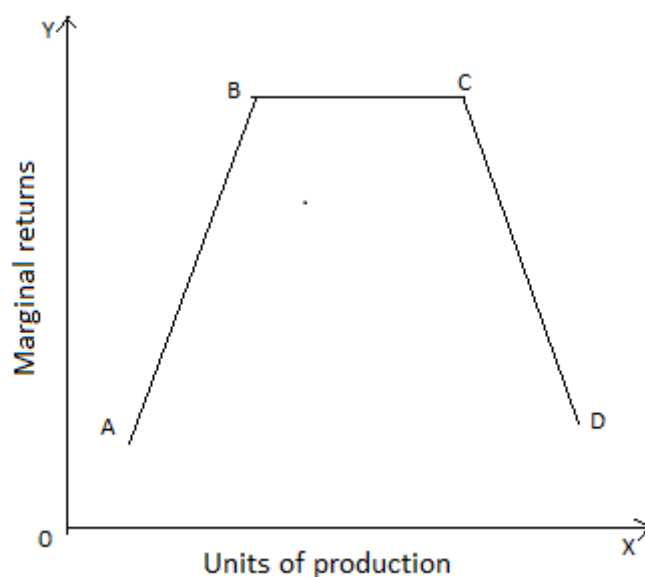
Increasing returns to scale happens when an increase in all factor inputs in a given proportion causes a more than proportionate increase in output. When the scale of production increases, there will be scope of specialization and division of labour. This will result in internal and external economies of scale. Internal economies occur as a result of the expansion of the individual firm. External economies of scale are those economies which occur to all firms as the industry expands. As a result, output increases higher than the increase in input.

### 2. Constant returns to scale

Constant returns to scale happens when an increase in all factor inputs in a given proportion causes an equal and proportionate increase in output.

### 3. Diminishing Returns to Scale

Diminishing returns happen when an increase in all factor inputs in a given proportion causes a less than proportionate increase in output. The increase of the scale of production beyond the optimum capacity brings diseconomies of scale in the form of congestion confusion inefficiency, etc. This is why diminishing returns occur. The three stages of returns to scale is illustrated below.





In the diagram, units of production are measured along the X axis and marginal output along the Y axis. When the unit of output increases the output increases differently. The portion AB shows increasing returns to scale, the portion BC shows decreasing returns to scale and the portion CD shows diminishing returns to scale.

### Causes of the operation of the Law

Economists have given different arguments while explaining the different returns to scale. As the economy increases the scale of operation, it may lead to greater division of labour and specialization. Greater degree of division of labour increases productivity of labour. If the scale of operation is larger, we can use highly specialized machinery. Hence there is increasing returns to scale. But when large scale operations take place, the efficient management and co-ordination of the productive activity become difficult. Diseconomies of production emerge here and lead to a less than proportionate increase in output. Hence, there is diminishing returns to scale.

### Applicability and Significance of the Law of Diminishing Returns and Returns to Scale

Until Marshall, it was thought that the law of diminishing returns applied to agriculture alone and the manufacturing industries were characterized by increasing or constant returns. But in actual practice the law of diminishing returns has vast general applicability. If the diminishing returns did not occur, sufficient amount of food grains could be grown even in a small piece of land by using more doses of labour and capital. Then there would not be the problems of food scarcity and famine. Similarly, constant returns is also limited by certain constraints.

The law of diminishing returns assumes that technical knowledge, equipment, etc. remain the same. So, continuous improvement in technique of production can avert the situation of diminishing returns. This point has special significance in the case of the agricultural sector of those countries which don't have enough arable lands. As per the Law of Returns to Scale, all factors have to be increased proportionally to make great changes in production. But this cannot happen especially in the case of land. So we can tune up technology to compensate for the deficient factor. Actually this was happened in the case of India's Green Revolution in which the food production shot up to pave the way for food sufficiency by resorting to intensive cultivation on scientific line.

### Economies and Diseconomies of Scale

The term **economies of scale** refers to the advantages resulting when a firm increases its scale of operation. The firm accrues technical, financial and managerial economies from large scale production. As output increases, the firm's average cost of producing that output is likely to decline. This can happen for the following reasons:

1. If a firm operates on a larger scale, workers can specialize in the activities at which they are most productive.

2. Scale can provide flexibility. By varying the combination of inputs utilized to produce the firm's output, managers can organize the production process more effectively.

3. The firm may be able to acquire some production inputs at lower cost because it is buying them in large quantities and can therefore negotiate better prices. The mix of inputs may change with the scale of the firm's operation if managers take advantage of lower-cost inputs.

The term **diseconomies of scale** refers to the disadvantages resulting from the very large scale production. As the scale of production increases much it becomes difficult for the managers to co-ordinate the business. Similarly, the advantages of buying in bulk may have disappeared once certain quantities are reached. At some point, the supply of key inputs may be limited pushing their costs up.

#### Suggested Readings:

1. Dominick Salvatore 'Microeconomic Theory', Schuam's Outline Series
2. A. Koutsoyannis : Modern Microeconomics, - Macmillan

## MODULE V

### NATIONAL INCOME

Module V :National Income-Concepts and Meaning, Gross Domestic Product, Gross National Income-Net National Product-Gross Domestic Product at factor cost and market price-GNP at market price and factor cost-NDP at factor cost and market price-NNP at factor cost and market price—Personal income-Disposable Income-Per capita income-Importance of the estimation of National income-Difficulties in the estimation of national income.

#### Introduction

Economic growth of a country measured with the help of change in its national income. The rate of growth of national income of an economy is indicative of the pace at which the economy has been growing. The rate of growth of national income when compared with the rate of growth of population indicates whether the economy is declining, stagnant or developing.

Alfred Marshall – “the labour and capital of a country acting on its natural resources produced annually a certain net aggregate of commodities, material and immaterial including services of all kinds. This is the true net annual income or the revenue of the country or the National Dividend.”

Simon Kuznets – “it is the net output of commodities and services flowing during the year from the country’s productive systems in to the hands of the ultimate consumers or into net addition to the country’s capital stock.”

#### Concepts:

##### **National Income:**

The money value of **all final goods and services** produced in a country during a **financial** year. National Income broadly means **the income earned by the residents** of a country **from work and property in an accounting or financial or fiscal** year. In India, an accounting year is **from 1<sup>st</sup> April of a calendar year to 31<sup>st</sup> March of the next calendar year.**

##### **National income Accounting:**

It is a tool used to summaries the performance of an economy by measuring its total income and production in a particular year. Or National Income Accounting is a method of presenting National income Accounts. National income Accounts are statistical statements on National income and other related macro economic aggregates.

#### Sources of Income

Following are the different sources of income.

- a) **Income from work:** People earn income mainly from work. The standard of living of the people depends on quantity and quality of goods and services consumed by them. It in turn depends on the money income of the people.
- b) **Income from property:** Properties like land, building, factories, machinery etc. can be lent out to others to earn income. The income so earned is called rental income.
- c) **Royalties:**-Income earned by those who own mineral wealth like iron ore, coals, natural gases etc. and by those who possess copy rights, patents etc. (intellectual property). The various types of properties mentioned above are called fixed assets or fixed capital.
- d) **Dividends:**-People can earn dividends by investing the surplus income in stocks and shares.
- e) **Interest:**-The surplus income used for purchasing bonds or debentures or lending to banks or other agencies may yield interest income .These incomes (d) & (e) are called liquid assets. The fixed assets and liquid assets together represent capital.

In countries like India economic growth is given more emphasis. The major problem in these countries is how to remove poverty and unemployment. Raising the standard of living of the people is yet another problem. These entire problems can be solved only by means of accelerating economic growth. Economic growth is a process by which the real national income and percapita real income of a country are increased for a period of time.

In India the Five Year Plans aim at accelerating economic growth. The First Five Year Plan set the target of doubling the 1950-51 national incomes by 1971-72 and the per capita income by 1977-78. However, the per capita income was doubled only by 1992-93. This was because of the high rate of growth of population in the country.

### **National Income at Current Prices and Constant prices**

National Income at current prices means the aggregate money value of all final goods and services produced in a country during a year, estimated on the basis of market prices in the prevailing year or the current year.

National income at current prices = (the volume of goods and services in the current year x market prices of goods and services in the current year)

$$N.I \text{ at current prices} = P(Q) + P(S)$$

Where, P = price per unit, Q = volume goods produced

S = volume of services

National income at constant prices means the money value of final goods and services in the current year calculated at their prices in a previous year ( base year).

National income at constant prices = (volume of goods and services in the current year x prices of goods and services in the base year)

$$N.I \text{ at constant prices} = \frac{\text{National at current price}}{\text{Price index in the current year}} \times 100$$

National at current prices is influenced by the changes in the prices. To know the increase in the real national income, we have to consider the national income at constant prices. In India, we have national income and percapita income figures both at current and constant prices since 1950-51 onwards.

### **Gross Domestic Product (GDP)**

The money value of all final goods and services produced in the domestic territory of a country during a year is called GDP.

Domestic territory of a country includes the following

- Political boundary including territorial waters
- Ships and aircrafts operated by the residents of a country between two or more countries.
- Fishing vessels, oil and natural gas rigs operated by the residents of a country in the international waters or where the country has exclusive rights to operate.
- Embassies, consulates and military establishments of the country located in other countries.

Normal residents of a country: All persons who ordinarily live in a country at least for one year and whose economic interest belongs to that country are called the normal residents of a country. GDP can be estimated both at market prices and at factor costs.

### **GDP at market price**

GDP at market price is defined as the money value of all final goods and services produced in the domestic territory of a country during an accounting year estimated at the prices prevailing in the markets.

$$\text{GDP at market price} = (\text{Gross National Product at market price}) - (\text{Net Factor Income from Abroad})$$

Net Factor Income from Abroad (NFIA) is defined as income attributable to factor services rendered by the normal residents of a country to the rest of the world less factor services rendered to them by rest of the world. That is, NFIA is the difference between the income received from abroad by the residents of a country for rendering factor services and the income paid for the factor services rendered by the non residents in the domestic territory of a country.

### **GDP at factor cost**

It is the estimation of GDP in terms of the earnings of factors of production. GDP at factor cost is the sum total of the earnings received by the factors of production in terms of wages, rent, interest and profit.

$$\text{GDP at factor cost} = (\text{GDP at market price}) - (\text{Net Indirect Taxes})$$

$$\text{Net Indirect Taxes} = \text{Indirect Taxes} - \text{Subsidies}$$

### **Gross National Product**

GNP is defined as the money value of all goods and services produced by the nationals of a country within the country and outside the country during a year.

$$\text{GNP at market price} = \text{GDP at market price} + \text{NFIA}$$

### **Gross National Product at factor cost**

$$\begin{aligned} \text{GNP at factor cost} &= \text{GNP at market price} - \text{NIT} \quad \text{or} \\ &= \text{compensation of employees} + \text{operating surplus} \\ &\quad + \text{mixed income} + \text{depreciation} + \text{NFIA} \end{aligned}$$

### **GDP and GNP comparison**

In order to distinguish between GDP and GNP we have to consider two terms; (a) domestic territory of a country and (b) nationality of citizens.

GDP is a territorial or geographical concept. It includes only those goods and services which are produced within the domestic territory of a country, during a year. However it does not include income generated by the home nationals in foreign countries. GNP, on the other hand, is a measure of the value of goods and services that the nationals or residents of the country produce regardless of where they are located. That is, GNP includes net factor income from abroad also.

$$\text{GDP} = \text{GNP} - \text{NFIA}$$

$$\text{GNP} = \text{GDP} + \text{NFIA}$$

In short, the difference between GDP and GNP arises from NFIA.

### **Net Domestic Product (NDP)**

Net Domestic Product is Gross Domestic Product minus depreciation or consumption of fixed capital.

Depreciation or consumption of fixed capital refers to the loss of value of fixed capital due to wear and tear in the process of production.

### **NDP at market price and factor cost**

NDP at market prices is the market value of all final goods and services produced within the domestic territory of a country less depreciation during a year.

NDP at market prices includes the contribution of foreigners residing in the domestic territory of a country. However, it excludes the contribution of the citizens of the country residing abroad.

$$\text{NDP at market price} = \text{GDP at market price} - \text{depreciation.}$$

NDP at factor cost is the total payments made by all the producers to all factors of production within the domestic territory of a country. In another word NDP at factor cost is the sum total of the earnings of all factors of production in the form of wages and salaries, rent, interest and profit.

$$\text{NDP at factor cost} = \text{NDP at market price} - \text{net indirect taxes}$$

### **Net National Product (NNP) at market prices**

It can be defined as the total value of final goods and services produced in an economy after allowing depreciation

$$\text{NNP at market price} = \text{GNP at market price} - \text{depreciation}$$

**Net National Product at factor cost or National Income**

NNP at factor cost is defined as the volume of goods and services turned out in country during an accounting year or it is the net value added at factor cost in country during a year. Or it is the sum total of domestic factor incomes and net factor incomes from abroad. Thus,

$$\text{NNP at factor cost or National Income} = \text{domestic factor incomes} + \text{NFIA}$$

Or

$$\text{NNP at factor cost or National Income} = \text{NNP at market price} - \text{NFIA}.$$

***Note***

1. *The difference between GDP and GNP is the value of NFIA*
2. *The difference between Gross and Net aggregates is the value of consumption of fixed capital or depreciation.*
3. *The difference between market prices and factor costs is the value of net indirect taxes.*

**PERSONAL INCOME**

Personal income is the income received by the households and non corporate business in a country during a year.

$$\begin{aligned} \text{Personal income} = & \text{National Income} - (\text{corporate profits} + \text{social security} \\ & \text{Contributions} + \text{net interest}) + (\text{dividends} + \text{transfers} \\ & \text{Government to individuals} + \text{personal interest income}) \end{aligned}$$

**DISPOSABLE INCOME**

Disposable income is the income actually available to the households and to the non corporate business after they have fulfilled their tax obligation to the government. That is, it is the income actually available to the individuals for saving and consumption.

$$\text{Disposable Personal Income} = \text{personal income} - \text{personal tax} + \text{non tax Payment}.$$

**Per capita Income**

It is the average per person national income.

$$\text{Per capita Income} = \text{National income} / \text{Population}$$

**Importance of the estimation of national income**

Importance of the estimation of national income accounts are given below.

1. **Indicator of economic performance**: it indicates the level of economic growth and welfare in a country. It tells us the achievement of a country after utilizing its natural, human, capital resources.

2. Indicator of structural changes: it throws lights on the structural changes of the economy. It informs us about the direction of changes in the relative shares of primary, secondary and tertiary sectors.
3. It helps in policy formulation: the information provided by the national accounts is very helpful for the formulation of various economic policies by the government.
4. It helps in making comparison: it helps us in comparing the national income and percapita income of one country with those of other countries.
5. It is helpful to the trade unions: national accounts reflex the nature of distribution of factor incomes. this helps trade unions in making rational analysis of the remunerations given to them. It helps them to make necessary actions to ensure considerable payments.
6. It is helpful to the UNO: it is helpful to the UNO for planning welfare programmes for the developing countries according to their requirements.

### **Difficulties in estimation of national income**

1. Conceptual difficulties: in the first place there have been the differences of opinion regarding 'Nation' in the concept of national income. It is argued that national income denotes the income of the nationals and as such income received by the nationals living abroad should be added with the income produced within the country.
2. Value of services: to calculate the value of services is very difficult. Many services in real life are rendered out of mercy, friendship and generosity which cannot be equated to money value. Similarly the services of home makers are excluded from the national income. This will undervalue the national income.
3. Illegal activities: income earned through illegal source like smuggling, black marketing etc are excluded from national income on account of social usefulness, though these incomes are outlawed, their exclusion will underestimate the national income.
4. Activities of foreign firms: the income generated by the foreign firms in a country also creates a problem in national income accounts. The problem is whether their income is a part of the national income of a country where they are located or that of the country which own the firms.
5. Choice between methods: another difficulty in estimating national income is connected with the choice between the methods of estimation. It is argued that any one or all of the methods could be used simultaneously depending, off course on the availability of data.
6. Stage of economic activities: in accordance with the purpose of national income estimation any stage of economic activity- production, consumption and distribution could be adopted. For example, if the purpose is to assess the economic welfare, then the consumption stage and if the aim to assess the economic potential, then the production stage could be more appropriate.
7. Double counting: the main difficulty in estimating national income is the problem of double counting. Double counting means the counting the value of a good more than once. The best way to avoid double counting is to calculate the value of goods and services that enter into final consumption. Another method of eliminating the double counting is to adopt the 'the value added' method of estimating national income



### **Special Difficulties in under developed countries**

1. Existence of non-monetised subsistence sector.
2. Difficulty in classifying economic activities.
3. Valuation of products is also very difficult.
4. Lack of proper accounts.
5. Inadequate and Unreliable statistics.

### **Measurement of National Income**

National Income can be measured in different ways. We look at national income in three ways:

- (a) As a flow of goods and services produced
- (b) As a flow of income and
- (c) As a flow of expenditure

Corresponding to the above three concepts, there are three methods of measuring national income. They are:

- (a) Value added method or product method
- (b) Income method and
- (c) Expenditure method

### **Value added method or Product method**

National income according to the value added method is the sum of net value added or net final output produced by all the producing sectors of an economy during a year. The net value added method is otherwise known as product method or net output method. This method approaches national income from the output side. According to this method national income is measured by adding up the money value of all final goods and services produced in an economy during a year.

This method involves three steps in computing national income. They are:

1. Identification and classification of production units into industrial sectors, i.e., primary sector, secondary sector and tertiary sector.
2. Estimation of net value added factor cost and
3. Estimation of net factor income from abroad.

### **Estimation of net value added at factor cost**

Net value added at factor cost = (net value added at market price – net indirect taxes)

Net value added at market price = (gross value added at market price – depreciation)

Gross value added at market price = (gross value of output – intermediate consumption)

Intermediate consumption means the consumption of secondary inputs or intermediary goods.

Gross value of output = P (Q) + P (S). i.e. the money value of all final goods and services produced.

### **Estimation of NFIA**

NFIA consists of net compensation of employees, net income from property and entrepreneurship (net operating surplus) and net retained earnings of resident companies abroad.

Thus, National income = Net value added at factor cost + NFIA

### **Income method**

The income method measures national income from the side of the payments made to the primary factors of production for their productive services in an accounting year. According to this method national income is calculated by adding up all the incomes accruing to the basic factors of production used.

After identifying the production units in to different sectors – primary, secondary and tertiary, the factor incomes received by the factors of production in all production sectors are added up. We get the factor incomes received by all the three sectors. The sum of this will give us the domestic factor incomes. When NFIA is added to the domestic factor incomes, we get national income.

The factor incomes are classified in to

1. compensation of employees
2. operating surplus
3. mixed income

National income = Domestic factor incomes + NFIA

### **Expenditure method**

This method measures national income from the expenditure side or by measuring final expenditure on GDP. The total expenditure is composed of two elements – consumption expenditure and investment expenditure.

There are four components of final expenditure on GDP. They are

1. Private final consumption expenditure.
2. Government final consumption expenditure.
3. Gross domestic fixed capital formation comprising gross fixed capital formation, changes in stock and net acquisition of valuable assets. and
4. Net exports. (exports – impost)

### **Estimation of National Income in India.**

- ✓ The First estimate of national income in India is prepared by Dadabai Naoroji in 1868. it was published in his famous work ‘Poverty and Un British rule in India’.
- ✓ The first scientific and reliable estimate of national income was done by V.K.R.V Rao for the year 1931-32.
- ✓ The first official estimate of National income was prepared by the ministry of commerce in 1948.

- ✓ The national committee was appointed in 1949 under the chairmanship of prof. P.C Mahalanobis.
- ✓ The first report of national income committee appeared in 1951 and its final report in 1954.
- ✓ The CSO (Central Statistical Organization) released the first issue of white paper on national in the year of 1956. from 1956 onwards, the CSO has been publishing annually national income statistics under the title ‘National Account Statistics’.
- ✓ We have series in national income estimate;
  - Conventional series (1948-49 as the base year)
  - Revised series (1960-61 as the base year)
  - New series (first with 1970-71 as the base year, later with 1980-81 and 1993-94 as the base year and at present 2004-05 as the base year.)

**NOTE:** *The national Income aggregates estimated **at current prices** are called **nominal** and those **at constant prices** are called **real** aggregates. The true indices of economic growth or welfare are real aggregates like real GDP, real NNP, real PCI etc.*

### **The GDP Deflator**

From nominal GDP and real GDP we can compute the GDP deflator. The GDP deflator, also called the implicit price deflator for GDP, is defined as

$$\text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}}$$

GDP Deflator is defined as the ratio of nominal GDP to real GDP. It measures the price of the typical unit of output relative to its price in the base year.

Suggested Readings:

1. Diwedi DN ‘Macroeconomics Theory and Policy’ Tata McGraw-Hill
2. Edward Shapiro : ‘Macro economics’ Oxford University press.
3. Gregory Mankiw : ‘Macro economics’ – 6th Edn. Tata McGraw Hill.

## MODULE VI

### MAJOR CLASSICAL POSTULATES

Major classical postulates, Say's Law of market-Full employment—Wage-price flexibility-Laissez-faire.

The term 'classical economist' was first used by Karl Marx to describe economic thought of David Ricardo and his predecessors including Adam Smith. According to JM Keynes, the whole set of economic ideas and principles propounded by Adam Smith, David Ricardo, JS Mill, JB Say and even Alfred Marshal and AC Pigou constitutes the classical economics. The major postulates of the classicals are the following

#### 1. Say's Law of market.

This is the core of classical economics. It was this so called Law which gave a concrete formulation to the idea that general overproduction and hence general unemployment were impossible. The assumption of full employment as a normal phenomenon of free market economy is justified by 'Say's Law of market'.

The law of market is propounded by J.B Say, an early nineteenth century French economist. The law states that "supply creates its own demand". In his words "it is production which creates market for goods, for selling is at the same time buying and more of production, more of creating demand for other goods. Every producer finds a buyer." That is every supply of output creates an equivalent demand for output, so that there can never be a problem general over production. Say's law thus denies the possibility of the deficiency of aggregate demand.

Say's law so conceived describes an important fact about the working of free exchange of economy that the main source of demand is the sum of incomes earned by the various productive factors from the process of production itself. A new productive process, by paying out income to its employed factors, generates demand at the same time that it adds to supply. It is thus production which creates market for goods.

#### Basic assumptions of Say's Law

1. The law operates only in free exchange economy where there is perfect competition.
2. There is free flow of money incomes. As and when incomes are received they are immediately spent
3. Savings are equal to investment and this equality is brought about by flexible interest rate.
4. The government follows the policy of laissez-faire and does not interfere in any manner with the operation of the market forces of demand and supply.
5. The size of market is limited by the volume of production, only then will demand equal supply or supply creates it own demand.

#### 2. Laissez-faire

The policy followed by the classicals is called the laissez-faire policy.(laissez-faire→a French word which means "Let things alone.") It is a policy of non-intervention by the government in individual or industrial economic affairs. The doctrine favours capitalist self-interest, competition and natural consumer preferences as forces leading to optimal prosperity and freedom.

According to the classical individual action motivated by enlightened self-interest and regulated by competition tend to promote individual as well as social welfare. They opposed all kinds of restrictions on economic activities as they hamper competition, and thus, interfere with the automatic working of the market economy. In short, there is no need for any governmental intervention in the economy.

### **3. Classical Theory of Employment**

The classical economists did not formulate any specific theory of employment as such. They only laid down certain postulates. The two broad features of classical theory of employment were : (a) The assumption of full employment of labour and other productive resources and (b) flexibility of prices and wages to bring about full employment.

#### **Assumption of Full employment**

The classical economists assumed that labour and other resources were always fully employed. According to them, the general over production and hence general unemployment is impossible. There may be lapses from full employment at times but these were regarded as temporary and abnormal. The normal situation is stable equilibrium at full employment. If at any time unemployment persists for long time it is because of the interference by the government or private monopoly with the free play of market forces or wrong calculations of businessmen or artificial resistances in the economy. The classical economists held the view that in a free competitive capitalist economy, there was always full employment or a tendency towards full employment. In short, full employment is a normal phenomenon according to the classical economists.

The normal full employment was guaranteed by the policy of the laissez-faire. According to the classical, the laissez-faire capitalism was self adjusting. They had great faith in free and perfect competition, efficiency of the profit motive and price mechanism to remedy the temporary disequilibrium in the economy and ensure full employment. The classical economists believed that savings are always equal to investment. This equality between savings and investment, they thought, was brought by the rate of interest. If aggregate demand falls short of aggregate supply, there may be temporary unemployment. But flexibility of interest rate would soon brought about adjustments, and lasting unemployment could not persist.

The classical theory does not explain what determines the level of employment. But instead, it assumes full employment and tries to explain the allocation of resources in production and the distribution of income among the resources involved in production. The market forces of demand and supply allocate resources as well as determine their rewards.

#### **WAGE-PRICE FLEXIBILITY**

According to the classical, the wages and prices are flexible. This flexibility ensures equilibrium in market. In other words, demand will be equal to supply in all markets.

All disequilibrium conditions in the market will be corrected with the wage-price flexibility. For example, when there is excess demand for labour, wage rate will increase which in turn increases the demand for labour. Similarly, when there is excess supply of labour, wage rate will fall and automatically supply will be reduced. Wage flexibility ensures that the market for labour is always in equilibrium. If there is general over production resulting in depression and un employment, prices would fall as a result of which the demand would increase, prices would rise and productive activity will be stimulated and un employment would tend to disappear and vice versa. As A.C.Pigou says, " With perfectly" free competition, there will always be at work a strong tendency for wage rates to be so related to demand that everybody is employed."

Suggested Readings:

1. Diwedi DN 'Macroeconomics Theory and Policy" Tata McGraw-Hill
- 2.. Edward Shapiro : 'Macro economics' Oxford University press.
3. Gregory Mankiw : 'Macro economics' – 6th Edn. Tata McGraw Hill.

---

## MODULE VII

### KEYNESIAN CONCEPTS

Major Keynesian Concepts, Effective demand-Consumption-Savings-Under employment equilibrium-Wage-price rigidity

#### **Introduction**

In the year 1936, Lord JM Keynes published his magnum opus “The General Theory of Employment, Interest and Money”. This was to provide a solution to the unemployment problem of the great depression 1930s. The publication of Keynes’s ‘General Theory’ brought about a new approach to economic analysis known as macro economics. Macro economics deals with the economy as a whole. It deals with economic aggregates like national income, aggregate demand, aggregate supply etc.

An important issue in macro economics is the determination of the level of income and employment. The crucial question is, what determines the level of income and employment in an economy? The classical economists like Adam Smith, JB Say and David Ricardo believed that a free unregulated economy will always be in equilibrium and that there will always full employment in the economy. Temporary disequilibrium will automatically corrected. The classical theory of full employment was based on the famous ‘Say’s Law of market’. According to JB Say “supply creates its own demand”. Whatever produced in the economy will automatically be demanded in the market because production (supply) generates equivalent income to demand the goods produced. If supply creates its own demand, general over production and under production are not possible. Price flexibility and wage flexibility will ensure equilibrium in the economy and at equilibrium the economy will be in full employment. Therefore, the classical economists believed in full equilibrium.

The classical theory was proved wrong during the Great Depression of 1930s. Over production, insufficient demand and massive unemployment discredited the classical theory. An alternative theory of income and employment was developed by Lord JM Keynes by publishing his master piece, “The General Theory of Employment, Interest and Money” in 1936.

Keynes rejected the classical theory of full employment. According to him the economy can be in equilibrium at less than full employment level. He calls this as ‘underemployment equilibrium’. The central theme of Keynesian theory is the principle of effective demand. According to JM Keynes, employment in an economy depends upon effective demand. Hence unemployment is due to deficiency of effective demand. Effective demand determined at the point where aggregate demand and aggregate supply are equal. Since, unemployment is caused by deficiency in aggregate demand, Keynes suggested the intervention of the government to increase aggregate demand and solve unemployment.

#### **Effective Demand**

The concept of effective demand is regarded as a logical starting point of Keynesian theory of income and employment.

*“The level of demand in the economy which is fully met by the corresponding supply so that there is no tendency on the part of entrepreneur to either expand or contract production is called effective demand”.*

In other words effective demand is equal to national income or the receipts of all members of the community in the form of rent, wages, interest and profit. These receipts are in turn spent on the purchase of product produced in the economy. The determinants of effective demand are aggregate demand and aggregate supply.

### **Aggregate Demand**

Aggregate demand is the sum of demands for current output by each of the buying sectors of the economy, households, business men, the governments and foreign purchasers. In other words the total demand in an economy at various levels of employment is referred to as aggregate demand.

### **Aggregate supply**

Aggregate supply shows the output forthcoming at each level of product price. The aggregate supply curve shows the total output firms will supply at each value of the aggregate price level. Or it refers to the total supply of goods and services in the economy. This is the same as the net national product at factor cost or national income.

### **Components of aggregate demand**

Aggregate demand is the total demand in an economy at various levels of employment. It is nothing but total expenditure on goods and services in an economy. Its main components are:

1. household consumption demand (C)
2. private investment demand (I)
3. government demand for goods and services (G) and
4. net exports demand [Exports (X) – Imports (M) = NX ]

That is, aggregate demand (AD) = C + I + G + NX

### **Household Consumption Demand (consumption function)**

***Consumption is the sole and purpose of production- Adam Smith.***

The functional relation that exists between income and consumption at different levels of income is called consumption function or propensity to consume.

$$C = f(Y)$$

Where, C = consumption

Y = income

The households consumption demand depends on its disposable income. Disposable income means the amount which the households is left with after paying personal taxes from the total income. Household consumption is a positive function of disposable income. That means as disposable income increases household consumption also increases. However, consumption does not increase as fast as income. When income increases consumption also increases but the rate of increasing consumption will be less than proportionate to the increase in income. This is the so called psychological law of consumption of JM Keynes.

The consumption function is a relationship between income and consumption expenditure. The two important aspects are:



- (a) Consumption expenditure varies directly with disposable income.
- (b) Keynes had stated in his ‘fundamental psychological law of consumption’ that in general, an individual increases his consumption expenditure when his income increases. However, the increase in consumption is less than the increase in income.

The non-linear consumption function can be expressed as

$$C = f(y), \text{ where } C = \text{consumption expenditure and } y = \text{disposable income.}$$

The linear consumption function can be expressed as  $C = a + bY$  where  $C =$  consumption expenditure,  $a =$  autonomous consumption (the consumption at zero level of income),  $b =$  marginal propensity to consume and  $Y =$  disposable income.

The propensity to consume can be classified into Average Propensity to Consume (APC) and Marginal Propensity to Consume (MPC). *The proportion between total income and total consumption is called average propensity to consume. The proportion between an increment in income and corresponding increment in consumption is called marginal propensity to consume.*

$$APC = C / Y$$

Where,  $C =$  total consumption and

$Y =$  total income

Suppose total income is Rs 1000 and total consumption is Rs 750. then  $APC = C / Y$ . which is equal to  $750 / 1000 = 0.75$  or 75%.

$$MPC = \Delta C / \Delta Y$$

Where  $\Delta C =$  change in consumption and

$\Delta Y =$  change in income

Suppose increase in income is Rs 100 and corresponding increase in consumption is Rs 70. Then  $MPC = \Delta C / \Delta Y = 70 / 100 = 0.7$  or 70 %.

### Saving function or propensity to save

Propensity to save or saving function expresses the relationship between saving and income.

$$\text{Symbolically, } S = f(Y).$$

We have already noticed that as income increases, consumption also increases but less than proportionately. This is because as income increases, people save more. Saving is the excess of production over consumption.

$$S = Y - C$$

Where  $S =$  saving,  $Y =$  income and  $C =$  consumption

As income increases, saving also increases but the rate of increase in saving is generally higher than that of income.

### Average Propensity to Save and Marginal Propensity to Save

The proportion between total income and total saving is called average propensity to save. Symbolically  $APS = S / Y$ .

The proportion of income that is saved out of additional or incremental income is shown as marginal propensity to save or it is the ratio of change in saving and change in income. Symbolically,  $MPS = \Delta S / \Delta Y$ .

$$APC + APS = 1$$

$$APS = 1 - APC$$

$$APC = 1 - APS$$

$$MPC + MPS = 1$$

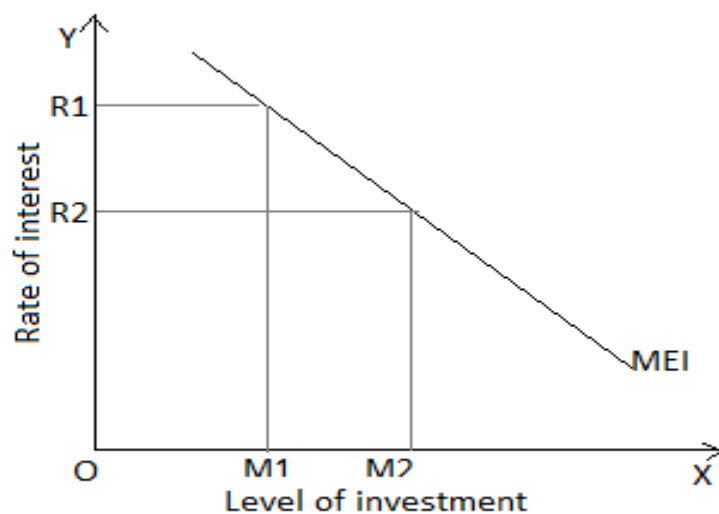
$$MPC = 1 - MPS$$

$$MPS = 1 - MPC$$

### Private investment demand

The second component of aggregate demand is investment demand of investment expenditure on the creation of new capital assets.

Entrepreneurs investing profits with an expectation of profit, therefore they will make investment only if the returns from investment are more than the cost of investment. The expected return on investment is the marginal efficiency of investment (MEI). MEI may be defined as the expected rate of returns from an additional unit of capital invested. Keynes called this as the marginal efficiency of capital. The cost of investment is the rate of interest. The MEI curves slopes downwards showing the negative relationship between investment demand and rate of interest. That is, more the rate of interest less the investment demand will be and vice versa.



The diagram shows the relation between the rate of interest, marginal efficiency of investment and the demand for investment.

### **Government demand for goods and services**

Government is another important buyer of goods and services. Government expenditures are for public needs, like schools, roads, health care maintenance of law and order, defense from external aggression and also to implement policies for countering inflation, depression, recession. The motive for these purchases is not profit but welfare of the nation.

### **Net exports or Net foreign demand**

**The difference between** exports and imports gives the net export of the country. It represents foreign demand for goods and services. This depends on the trade policy of the governments, relative prices of goods, incomes of the nations and foreign exchange rates etc.

### **The aggregate supply**

Aggregate supply is the aggregate cost of producing the output. It represents the country's net national product at factor cost. In money terms it is the aggregate producing the output which goes to factors as income in the form of rent, wages, interest and profit.

### **Determination of income and employment**

The level of income and employment is determined by the aggregate demand and aggregate supply. For simplicity, in the aggregate demand only consumption demand and investment demand are taken into account. I.e.  $AD = C + I$

Similarly, aggregate supply consists of consumption and saving, since the factor incomes are used either for consumption or saving. Therefore  $AS = C + S$

The equilibrium if income and employment is determined where the aggregate demand equals aggregate supply. Wherever aggregate demand and aggregate supply are equal, saving and investment are necessarily in equilibrium. This can be explaining through simple equations.

$$AD = C + I \text{ and}$$

$$AS = C + S$$

$$\text{If } AD = AS, C + I = C + S$$

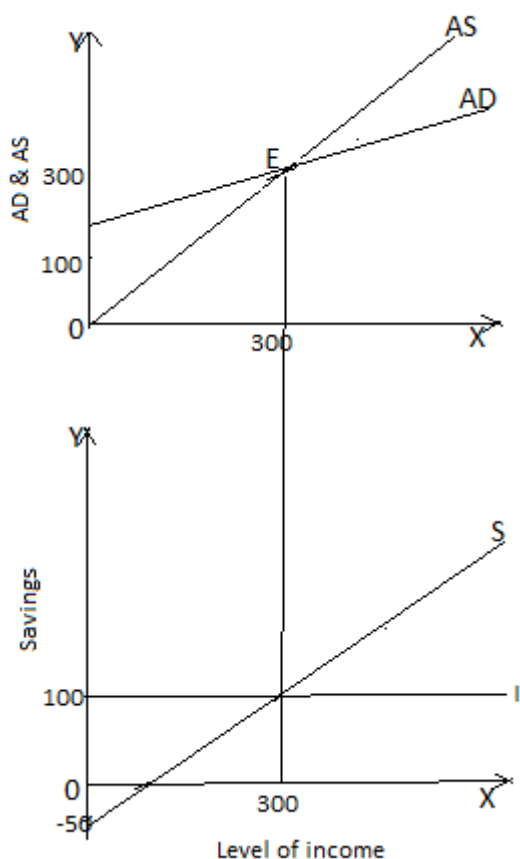
$$\text{Therefore } I = S$$

The equilibrium point of AD & AS (I and S) determines the equilibrium level of income and employment in the economy. Following table explains determination of income and employment.

Y	C	S	I	AD	AS
0	50	-50	100	150	0
100	100	0	100	200	100
200	150	50	100	250	200
300	200	100	100	300	300
400	250	150	100	350	400
500	300	200	100	400	500

According to the table the equilibrium level of income takes place at Rs 300 crores because at this level  $AD = AS$ . Similarly, here saving is also equal to investment (100 crores). The equilibrium can never be at any other level of income. E.g: if the level of income Rs 200 crores, people are willing to spent Rs 250 crores here the demand exceeds supply and the level of pain would be increased. Similarly, if the income is Rs 400 crores, AD is Rs350 crores and  $AS = 400$  crores. This is the case of excess supply. And at this level production will be decreased. Therefore, the level of income and employment is determined at the point where  $AD = AS$  (Rs 300 crores). At this point saving is also equal to investment (Rs 100 crores).

The equilibrium may be below or above the level of full employment. As against the classical theory of Keynes held the view that, there exist the under employment equilibrium in a free enterprise economy. The determination of income and employment can be explained with the help of following diagram also.



### The Multiplier

The theory of multiplier is an integral part of the Keynesian theory of employment. Changes in net investment cause change in income. These changes in income are a multiple of the change in investment. This multiple is called multiplier. The multiple changes in income, due to a change in investment is called investment multiplier. i.e. multiplier is defined as the ratio of the change in income to the investment. Symbolically,

$$K = \Delta Y / \Delta I$$

$$\text{Or } K = 1 / \text{MPS} \quad \text{or} \quad K = 1 / (1 - \text{MPC})$$

As the value of MPC rises, the value of multiplier also rises. If an increase in investment is Rs 10 crores and increase in income is 40 crores. Then

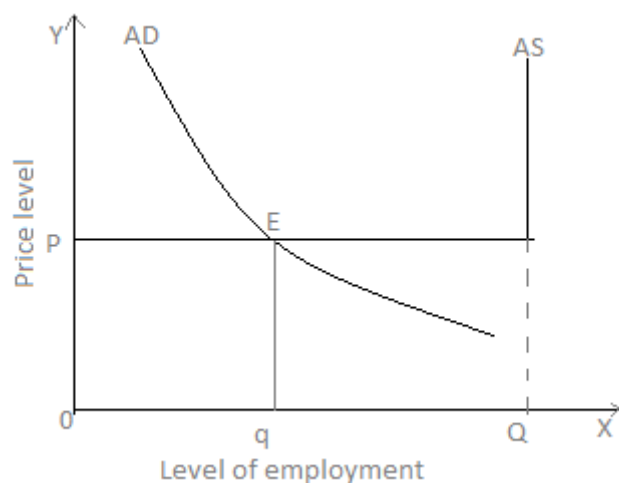
$$K = \Delta Y / \Delta I = 40 \text{ crores} / 10 \text{ crores} = 4$$

The comparison between basic postulates and economic ideas of classicals and Keynes is given below.

<b>CLASSICAL ECONOMICS</b>	<b>KEYNESIAN ECONOMICS</b>
Stable full employment equilibrium in the economy	Under employment equilibrium in the economy
Policy of laissez-faire	Policy of government intervention
Say's law of market – supply creates its own demand	Deficiency of aggregate demand
Saving-investment equality is determined by the rate of interest	Saving-investment equality is determined by the level of income
Investment is a function of rate of interest.	Investment is a function of marginal efficiency of capital and rate of interest
Money is neutral	Money is non neutral except at full employment and at liquidity trap
Wage-price flexibility	Wage-price rigidity
Interest is the reward for abstinence or waiting	Interest is the reward for parting with liquidity
Long run	Short run

### **Under employment equilibrium**

Even if there is equilibrium between aggregate demand and aggregate supply, there can be unutilized resources. So long as there is involuntary un employment, an economy is said to be in under employment equilibrium even if there is no mismatch between aggregate demand and aggregate supply. In the employment of labour there is wage-price rigidity. Besides, marginal product of labour is constant according to Keynes. So aggregate supply is perfectly elastic with respect to price below full employment. In such a situation, the level of aggregate determines the equilibrium level of output and employment. Full employment level requires a particular level of aggregate demand. But when the level of aggregate demand is deficient, there will be under employment equilibrium. This situation is shown in the following figure.



AD is the aggregate demand curve and AS is aggregate supply curve. P is the equilibrium price at the equilibrium output level of q. But this equilibrium is an under employment equilibrium, full employment level of output being Q.

According to Keynes, increase in aggregate demand is the only way to take an economy to the full employment level. Increasing the government expenditure is the major way to strengthen aggregate demand when the economy is in depression.

### WAGE-PRICE RIGIDITY

According to the classicals, the wages and prices are flexible. This flexibility ensures equilibrium in market. In other words, demand will be equal to supply in all markets. All disequilibrium conditions in the market will be corrected with the wage-price flexibility. For example, when there is excess demand for labour, wage rate will increase which in turn increases the demand for labour. Similarly, when there is excess supply of labour, wage rate will fall and automatically supply will be reduced. Wage flexibility ensures that the market for labour is always in equilibrium. If there is general over production resulting in depression and an employment, prices would fall as a result of which the demand would increase, prices would rise and productive activity will be stimulated and an employment would tend to disappear and vice versa. As A.C.Pigou says, "with perfectly free competition, there will always be at work a strong tendency for wage rates to be so related to demand that everybody is employed."

But according to Keynes there is wage-price rigidity. In the real world it is not possible to reduce the wages on account of government policy and due to the existence of trade unions. So the wages are more or less rigid rather than flexible. Similarly, the prices of goods and services are also not flexible. A reduction in prices and wages will bring about deficiency in aggregate demand which will reduce the level of effective demand. A reduction in effective demand will finally be leading the economy into depression.

Suggested Readings:

1. Diwedi DN 'Macroeconomics Theory and Policy' Tata McGraw-Hill
2. Edward Shapiro : 'Macro economics' Oxford University press.
3. Gregory Mankiw : 'Macro economics' – 6th Edn. Tata McGraw Hill.

