Directorate of Distance Education

UNIVERSITY OF JAMMU
JAMMU

SELF LEARNING MATERIAL
B. A. SEMESTER - I

Subjet : Economics | **Unit : I to IV**
Code No. : EC - 101 | **Lesson No. : 1 to 26**

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ECONOMICS

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ECONOMICS : EC - 101

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SYLLABUS

ECONOMICS

Course No. : EC-101 **Title : Micro-Economics**

Duration of Exam : 3 Hrs. **Total Marks : 100**

Theory Examination : 80

Internal Assessment : 20

PREAMBLE : As a foundation course, the aim of this paper is to make the student understand the behaviour of economic agents, namely, consumers, producers; other factors of production and the price movements in a market. The approach of this paper will generally be in static and partial equilibrium framework.

UNIT- I : INTRODUCTION :

Nature and scope of Economics; Market price determination - demand and supply; Utility - Laws of diminshing and Equi-marginal utility; Indifference cuves : meaning and properties ; consumer's equilibrium; Elasticity of demand; degrees, types (price, income and cross) and methods for measuring price elasticity of demand; Consumer's surplus (Marshall's interpretation)

UNIT-II : THEORY OF PRODUCTION AND COST :

Production Function - Meaning and types; Isoquants - meaning and properties; Producer's equilibrium - least cost combination of factors; Expansion path; Law of variable proportions; Returns to scale; Economies of scale (internal and external); Different cost curves and their relationship.

UNIT-III : MARKET STRUCTURE :

Markt forms - perfect and imperfect; Short-run and Long-run Equlibrium of the firm - Perfect competition, Monopoly; Price Discrimination; Monopolistic competition, Oligopoly : Sweezy's Kinked Demand Model of Oligopoly.

UNIT-IV : FACTOR PRICING AND WELFARE ECONOMICS :

Marginal productivity theory of distribution (classcial); Modern theory of wages; Ricardian theory of rent and Concept of quasi rent; Classical and Keynesian theories of interest; Theories of profit - Risk, Uncertainty and Innovation, Concept of Welfare Economics; The Pareto-Optimality (marginal conditions).

Note for Paper Setting : The question paper will contain two sections. In the first section, two questions from each unit i.e. 8 questions in total will be asked. The candiate will be required to answer four questions of 6 marks each, (choosing one question from each unit) whose word limit will not exceed 250 words each. Second section will contain two questions from each unit i.e. 8 questions in total. The candidate will be required to answer one question from each unit i.e. a total of 4 questions. There will be internal choice with each unit. Each question will carry 14 marks and word limit will not exceed 600 words.

INTERNAL ASSESSMENT (TOTAL MARKS : 20)

(i) Two Written Assignments / : 10 marks each

SUGGESTED READINGS :

Ahuja, H. L. : Advanced Economic Theory - Microeconomic Analysis S. Chand and Co. New Delhi

Bhutani, Prem J. : Principles of Economics, Taxmann's Publications (P) Ltd. New Delh.

Chopra, P. N. : Principles of Economics, Kalayani Publishers, New Delhi.

Dwivedi, D. N. Microeconomics, Vikas Publishing House, New Delhi

Koutsyiannis, A : Modern Microeconomics, Macmillan Publishers Ltd., New Delhi.

Lipsey, R. G. and Chrystal, K.A. : Principles of Economics, Oxford University Press, Oxford.

Mithani, D. M. : Microeconomics, Himalaya Publishing House, Mumbai.

Samuelson, P.A. and Nordhasus, W.D : Economics, Tata Mc Graw Hill, New Delhi.

Seth, M. L. : Micro Economics, Lakshmi Narain Agarwal, Publisher, Agra.

Stonier, A. W. and Hague, D.C. : A Textbook of Economic Theory, ELBS & Longman Group, London.

EC 101

Semester - I **LESSON No. 1**

NATURE AND SCOPE OF ECONOMICS

Objectives :

After going through this lesson, you should be able to :

- understand the meaning of Economics;
- familiarize with few definitions of Economics given by renowned economists.

Structure :

1.1 MEANING OF ECONOMICS

Introduction : The science of Economics assumed its formal outlook when Adam Smith, the father of Economics brought out his famous book, 'The Nature and causes of Wealth of Nations' in 1776. At its birth it was known as Political Economy. The word Economics has been taken from two Greek words 'Oikos' means a house and 'nemein' means to manage.

It has been defined differently by different Economists from time to time. Broadly, the various definitions of Economics can be grouped together under four heads :

(i) Wealth, (ii) Welfare (iii) Scarcity and (iv) Growth.

Economics as a science of wealth : This view is associated with Adam Smith and his disciples. The main points were :–

(a) Economics is the study of wealth only. It deals with consumption, production, exchange and distribution.

(b) Only such material commodities constitute wealth as are scarce and useful. Non-material goods like services and free goods like air and water are not wealth.

(c) Economics studies the causes of wealth changes which means economic development. To increase wealth, production of material goods will have to be stepped up.

Economics as a science of material welfare : This view point has been given by Marshall, Pigou, Cannon and Sir Beveridge. They have given more emphasis to human welfare than to wealth. Marshall emphasised that wealth is for man and man is not for wealth. He said, "Economics is on the one side a study of wealth and on the other and more important side, a part of the study of man."

Economics as a science of scarcity : Robbins gave a more scientific definition of Economics. He said, "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses." The central idea of the definition is (a) wants are unlimited but (b) the means to satisfy the human wants are limited or scarce, (c) the means or resources can be put to different uses (d) we are faced with the choice of using the limited means to satisfy this want or that. Much of man's economic activity is moving around the problem of scarcity or choice.

Economics as a science of growth and development : Paul Samuelson has given a more comprehensive definition of Economics. According to him, "Economics is the study of how men and society choose with or without the use of money, to employ scarce productive resources which could have alternative uses, to produce various commodities over time and distribute them for consumption now and in future amongst various people and groups of society."

Of all the definitions discussed above, the 'growth' definition appears to be most satisfactory. But some modern economists have tried to give new definitions of economics, which covers the theory of income and employment determination as well as of economic growth.

Modern Definition : The credit for bringing about a revolution in economic thinking goes to late lord J.M. Keynes. According to him, Economics studies how the levels of income and employment are determined. Thus, is a Keynesian term Economics is defined as the study of the administration of scarce resources and of the determinants of income and employment.

In Benham's words, "Economics is a study of the factors affecting the size, distribution and stability of a country's national income".

Prof Henry Smith has given a more correct definition of economics. According to him economics is, "the study of how in a civilized society one obtains the share of what other people have produced and of how the total product of society changes and is determined".

Thus, a study of economic growth and of economic stability forms an integral and important part of adequate definition of economics must cover them.

1.2.0 NATURE AND SCOPE OF ECONOMICS :

By scope, we mean the area of its study or the extent of its study. It is essential to know the boundaries of the study of economics for scientific analysis. Scope of economics answers mainly the following three questions :–

I. What is the subject matter of Economics?

II. What is the nature of Economics?

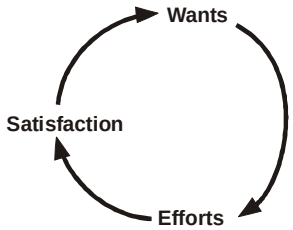
III. What are the limitations of Economics?

1.2.1 SUBJECT MATTER OF ECONOMICS :

Subject matter of economics is a controversial subject. That is why Mrs. Barbara Wooton said, "whenever six economists are gathered, there are seven opinions". The classical economists like Adam Smith, J.S. Mill, David Ricardo, J.B. say regarded economics as a science which studies wealth. Wealth formed

the subject matter of economics. Marshall removed the defects of the classical view. He regarded Economics as a social science studying all those human activities, which are related to material welfare. Prof. Robbins found faults with Marshall's view. He made Economics a discipline which studies scarce means in relation to unlimited wants.

The scope of economics is very vast. In economics, we study the circular flow of efforts made to satisfy wants and the resulting satisfaction from these efforts. The economic circle shows that man has several wants. In order to satisfy his wants, he makes efforts and thus produces goods and services. From the consumption of their good and services, he gets satisfaction. When a particular want is satisfied, another want take its place. So the circular flow of wants goes on.



Types of wants :

Wants are of two types.

Natural wants : Those wants, which are satisfied by the free gift of nature like wind, water, heat etc. We do not have to make efforts to fulfiled them fulfiled. Such wants are not studied in economics.

II. Artificial wants : These are satisfied with the man made goods and services like cloth, good, services of a doctor etc. We have to make efforts to satisfy them. Only there wants form the subject matter of economics.

The study of wants, efforts and satisfaction is divided into various sections of study. They are:- consumption, production, exchange, distribution, public finance and international trade. Both micro and macro types of economic activities are studied in Economics. Static as well as dynamic economic activities come under the study of Economics.

In consumption, the laws concerning human wants are studied. For example, law of diminishing marginal utility, law of equi-marginal utility, etc. In production, we study the means of production and the laws of production. In exchange the

price determination through the forces of demand and supply is studied. We know that production is the result of the combined efforts of the four factors of production. This division is studied in the distribution section of Economics. The other important sections are Public Finance and International Trade.

According to Crapman, "Economics is that branch of knowledge which studies the consumption, production, exchange and distribution of wealth."

Thus, we can conclude that all economic problems, economic policies and economic laws, which are concerned with economic activities and human welfare, are included in the subject matter of Economics.

1.2.2 NATURE OF ECONOMICS :

There is a difference of opinion among economists regarding the nature of economics. There are many economists who consider Economics a science;, on the other hand, many Economists regard it as an art. In order to derive a conclusion about the nature of Economics, we must answer the following questions :

I. Is Economics a Science or an Art?

II. Is Economics a Positive science or a normative science?

Economics as a Science : A science is a systematic and comprehensive study of knowledge which explains the cause and effect relationship. The main features of science are :-

(i) A science is a systematised study of a subject.

(ii) Science establishes the relationship between cause and effect of a fact.

(iii) Laws of science are universal.

Arguments in favour of Economics as a science :

I. Systematised study : The subject matter of economics is systematically divided into consumption, production, exchange, distribution and public finance. Thus, it satisfies the first requirement of science.

II. Scientific laws : In laws, we establish cause and effect relationship of

economic activities. Thus, laws of economics are similar to the laws of other sciences.

III. **Experiments :** Economics carry several experiments with the laws of economics. Its scope is very wide. The laboratory of there experiments is the world.

IV. **Measuring Rod of Money :** Economics possess the measuring rod of money to measure the economic facts. Therefore, economics has the quality of quantitative measurement of a science.

V. **Universal :** Much of the economic laws are universally true. Whether it is a capitalist, socialist or a mixed economy, they are equally applicable.

VI. **Economics as an Art :** Art is the practical application of knowledge for achieving definite ends. It means practice of knowledge. It is completely different from science. A science teaches us to know and art teaches us to do. Whereas science may study the causes and effects of a phenomenon, art shows solutions to the various problems. A science is theoretical, and art is practical.

Economists like Marshall, Pigou etc. regard economics as an art due to the following reasons :–

I. **Solution of the problem :–** Economics can be helpful to human beings only if it is able to solve their problems. It solves that fundamental economic problem: the problem of relative scarcity and the problem of choice.

II. **Promote Welfare :–** Modern economists spend a lot of their time to find solutions to the problems of rising prices, depression, unemployment, economic development etc. Economics as an art, tries to promote the welfare of human beings.

III. **Verification of economic laws :–** When we actually apply the economic laws only then we come to know that whether their result are true on false. The reality of economic laws can be judged only if economics is studied as an art.

Thus economics is both a science and an art. It is 'science' in methodology and 'art' in its application. But to be specific it is more a social science because it deals with the society.

Economics as Positive Science or as Normative Science : After deriving the conclusion that economics is a social science, another controversy is-whether it is a positive or normative science. Positive science only explores the facts while the normative economics also suggests.

Economics as a Positive Science : Positive science explains the real nature of a subject. It establishes the relationship between the causes and effects of a particular event as it happens. It answers the questions of what, when and how. In positive science, we are basically concerned with determination of national income and employment, consumption and investment ad general prices. We only observe facts, we do not comment whether the things are ethically or morally right. We do not pass value judgement regarding rightness or wrongness of a thing. We do not comment what should be the level of national income and employment, savings and investment rates, prices etc.

Arguments in favour of Economics as positive science :

I. **It is based upon logic :** With the help of logics, it establishes the relationship between cause and effect. In this way, it shows the effect of a particular step taken at a time. On the basis of logic, it cannot be said what should be done or what should not be done.

II. **It is based upon the principle of specialisation of labour :** On the basis of division of labour, Robbins pleads that an economist should confine himself to only the economic activities.

III. **No confusion :** Economics is regarded as a positive science on one more ground explaining only what, when and how. It will not answer another question what ought to be to avoid confusion.

IV. **More uniformity :** The study of what ought to be will cause much controversy in the subject. So Economics as a positive science will be more uniform in decisions regarding different problems.

V. **More Neutrality :** If the economist deals with the two questions: What is and what ought to be, he cannot be neutral; because when he deals with the second question, he tries to explain the facts according to his own suggestions.

Economics as a Normative Science : Normative science is one, which explains the events or facts, as they ought to be. Normative science gives decisions regarding value judgement i.e, it is concerned with describing what should be the things. e.g. what should be the level of national income, wage rate, how the fruits of national product should be distributed etc.; all fall within the preview of normative Economics. Unlike positive Economics, which is based on logic or scientific reasons, normative Economics is based on ethical, moral, philosophical and religious beliefs of the people.

Many economists like Pigou, Marshall, Hawtrey are of the opinion that Economics is a normative science. According to Prof. R.T. Bye, "the real function of all science is in the use we can make of it to promote the ends of human welfare". The aim of the economist is not only to explore and explain but also to condemn and suggest.

Arguments in favour of Economics as Normative Science :

I. **Man is not only logical but also sentimental :** The second feature of man make Economics as a normative science as well. According to Mahatma Gandhi, "Economics which disregards moral and sentimental considerations is like wax works that being life-like, still lacks the life of a living flesh".

II. **Importance of Economics :** Economics can be helpful and popular only if it explains, explores, condemns and suggests also. It does all these things, that is why it is a normative science also.

III. **A means of social betterment :** Economists from time to time gave different views regarding the welfare of human beings e.g. Malthus had alarmed us about dangers of rising population and also suggested measures to remove unemployment. So it is a normative science.

IV. **Basis of economic Planning :** Economic plans are formulated on the

basis of the suggestions of different economists regarding different problems. Thus, it is normative science dealing with what ought to be.

Conclusion :

We may say that the technique is important and ought to be as scientific as possible, but it assumes significance only when it helps to study economic problems and suggest remedies. According to J.S. Mill, "A man is not likely to be a good economist if he is nothing else. Thus, Economics is both a positive and normative science.

1.2.3 LIMITATIONS OF ECONOMICS :

A study of limitations of Economics is necessary to clearly understand the scope of Economics. The main limitations are :–

I. **Study of activities related to wealth :** Man has to do several activities during his lifetime like religious, cultural, social, political and economic. Economics deals with economic activities of man only which are related to wealth.

II. **Study of normal man :** Another limitation of economic laws is the normal man. A man may be abnormal like madman, drunken, miser etc. but not studied in Economics.

III. **Study of social man :** Prof. Marshall said that a man who lives in jungles like saint, monk etc. is not studied in Economics.

IV. **Study of scarce commodities :** Free goods are not studied in Economics. So they are outside the scope of Economics.

V. **Study of real man :** Imaginary and fictitious persons are not the subject matter of Economics.

VI. **Economic laws :** Economic laws are not purely scientific laws. The reason is that man is affected by nature, environment, tastes, habits, customs etc. So economic laws can't be taken like those of pure sciences like Physics and Chemistry.

VII. Other things being equal : Man is the subject of its study. Man is affected by the changes in customs, habits, fashions etc. These are not universal and they are not applicable at all times.

In order to understand the principles of Economics, these limitations need to be understood.

SELF-ASSESSMENT EXERCISE :

Q 1. "Scope of Economics covers a wide range of economic activities". Discuss.

Q 2. Discuss scope of economics in modern days.

Q 3. Is economics a Science or an Art subject?

Q 4. Distinguish between positive Economics and normative Economics. Explain some of the questions which are explained in each of them.

Q 5. Discuss Nature and Scope of Economics.

Q 6. Do you agree that the study of limitations of Economics is necessary to clearly understand the scope of economics?

FURTHER READINGS :

Modern Microeconomics by H.L. Ahuja.

Principles of Economics by P.N. Chopra.

Principles of Economics by M.L. Seth.

Modern Economic theory by K.K. Dewett.

EC 101

Semester - I **LESSON No. 2**

MARKET PRICE DETERMINATION - DEMAND AND SUPPLY

Objectives :

After studying this lesson, you will be able to :

- understand the determination of market equilibrium with the help of market demand and supply curves.

Structure :

2.1.0 Demand and supply: Market equilibrium

2.1.1 Meaning of Demand

2.1.2 Law of Demand

2.1.3 Meaning of Supply

2.1.4 Law of supply

2..2 Market Equilibrium

2.1.0 DEMAND AND SUPPLY MARKET EQUILIBRIUM

2.1.1 MEANING OF DEMAND :

In Economics, use of the word 'demand is made to show the relationship between the prices of a commodity and the amounts of the commodity which consumers want to purchase at those prices. From this, two things are clear : firstly, demand always refers to demand at a price. If demand is not related to prices, it convey no sense. It should be always related to price. Secondly, demand always means demand per unit of time. The time may be a day or a month or so.

Features of demand :–

I. **Difference between desire and demand :** A desire will become demand only if a consumer has the means to buy a thing and also he is prepared to spend the money. Demand is not only the need, it also implies that the consumer has the money to purchase it.

II. **Relationship between demand and price :** Demand is always at a price.

III. **Demand at a point of time :** The amount of demand must refer to some period of time.

According to Person, "Demand implies three things : (a) desire to possess a thing, (b) means of purchasing it and (c) willingness to pay for purchasing it."

2.1.2 LAW OF DEMAND :

Law of demand establishes a relationship between the price and the quantity demanded of a commodity. Other things remaining the same, when the price of a commodity rises, its demand will fall. Price and demand move in opposite directions. However, there is no proportionate relationship between price and demand. A 10% fall in price may not necessarily lead to 10% increase in demand.

Definitions :–

According to Marshall, "the greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchases, or in other words, the amount demanded increases with a fall in price and diminishes with a rise in prices".

According to Samuelson, "Law of demand states that people will buy more at lower prices and buy less at higher prices, other things remaining the same".

According to Meyers "people demand a larger quantity of goods and services only at a lower price than at a higher price".

Assumptions :

I. No change in the tastes and preferences of consumers.

II. The prices of other things both of substitutes and complements remain unchanged.

III. No close substitute.

IV. There is no 'prestige value' for the product in question.

V. Consumer's income must remain the same.

Explanation of the law : The response of amount demanded to changes in price of a commodity is known as the demand schedule. The demand schedule may be the individual demand schedule, which refers to the prices, and amount demanded of the commodity by an individual. In price theory we are mainly interested in the market demand schedule. Therefore, market demand schedule is defined as the quantities of a given commodity which all consumers will buy at all possible prices at a given amount of time.

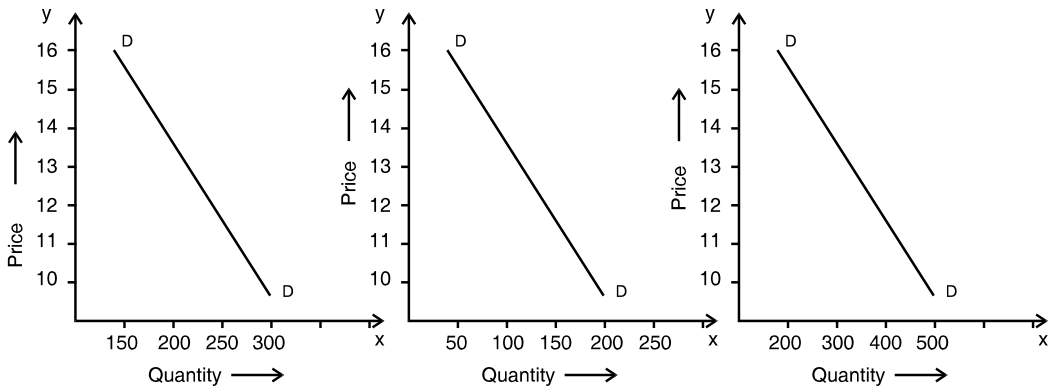
The following table shows the Individual demand schedules of buyers A and B and the Market demand schedule where there are two buyers.

Table I

Price per unit of X in Rs.	Amount demanded by buyer A	Amount demanded by buyer B	Total market demand
Rs 16	150	50	200
Rs 15	175	75	250
Rs 14	200	100	300
Rs 13	220	125	345
Rs 12	250	150	400
Rs 11	275	175	450
Rs 10	300	200	500

Demand Curves : Like the demand schedules there can be an individual demand curve and market demand curve. Individual demand curve is the graphical

representation of Individual demand schedule and market demand curve is the horizontal summation of the Individual demand curves in the market. The following diagram 2.1 shows the individual demand curves of consumer A and B and the market demand curve.



A's Demand Curve B's Demand Curve Market Demand Curbve

(A) (B) (C)

The demand curves slope from left down to the right. This is, they have a negative slope. As a result, the market demand curve Dd is also negative sloped.

2.1.3 MEANING OF SUPPLY :

Supply means the quantity offered for sale by producers at a particular price. Two important points are :–

(i) Supply refers to what producers offer for sale at a given price and

(ii) Supply is a flow concept. The quantity supplied is so much per unit of time, per day, per week, per month or per year.

Determinants of Supply :

I. **Price of the good :** Ceteris Paribus, the higher price of a good the greater the quantity of it that will be produced and offered for sale.

II. **Production technology :** The supply of a particular commodity depends upon the state of technology and changes in it. As technology progresses, it becomes possible to produce commodities more cheaply.

III. **Prices of factors :** Another important factor which influences the supply of a commodity is cost of inputs i.e prices of factors of production. Decrease in the prices of these inputs makes it possible to produce commodities more cheaply.

IV. **Prices of other commodities :** The supply of a commodity depends not only on the prices of the concerned commodity but also on the prices of other commodities. If the price of a substitute goes up, firms will be tempted to divert their resources to the production of that substitute. If price of a complementary product goes up, the supply of the product in question also rises.

V. **Objectives of the firm :** Some firms want to maximise their profits. For that they will produce and supply that much quantity which fetches maximum profits to them. Some other firms may believe in lower margin and high sales turnover.

VI. **Number of producers :** If the number of firms is more, output also increases.

VII. **Time :** Supply is a function of time also. In the long run, it becomes possible to overcome some constraints.

VIII. **Govt. Policy :** The govt. may levy taxes in the form of excise duty or sales tax or import duty, or may grant subsidies. If tax is levied on a product, its cost of production will go up and the quantity supplied will go down. Subsidies on the other hand, reduce the cost of production and thus encourages the producers to produce and sell more.

IX. **Future price expectations :** During inflation, sellers normally expect the prices to rise further. Therefore, they will tend to hoard the commodity. This will reduce supply and will cause its price to rise further.

2.1.4 LAW OF SUPPLY :

The law of supply explains the functional relationship between price and quantity supplied According to this law, ceteris paribus, an increase in price of a commodity causes an increase in its quantity supplied and a decrease in its price

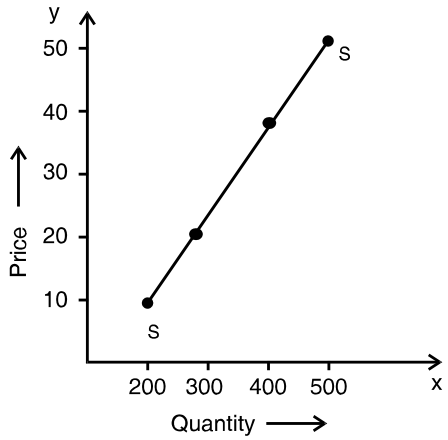
causes its quantity supplied to fall. Thus, we find a positive relationship between price and quantity supplied. It is based on the fact that higher profits provide the producers an incentive to produce more.

The law of supply can be explained through supply schedule and supply curve given below :–

Table 2

Supply Schedule

Price per unit of X in Rs.	Total Market supply of commodity X.
Rs. 10	200
Rs. 11	250
Rs. 12	300
Rs. 13	350
Rs. 14	400
Rs. 15	450
Rs. 16	500



Supplied

Fig.

We can plot the data from Table 2 on a graph. Price is plotted on y-axis

and quantity on y-axis. We will get SS supply curve it slopes upwards to the right indicating a positive relationship between the price and quantity supplied as shown in the Fig.

3.3.5 MARKET EQUILIBRIUM :

Given a single pair of demand and supply curves in a market, price and quantity of the product are determined at the equilibrium point where these two i.e. demand and supply curves intersect.

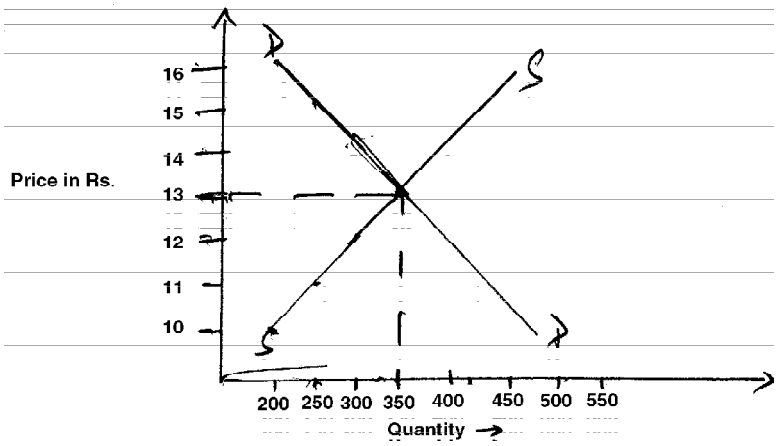


Table 3

Quantity Demanded and Supplied of X at various prices

Prices	Units Demanded	Units Supplied
Rs. 10	500	200
Rs. 11	450	250
Rs. 12	400	300
Rs. 13	350	350
Rs. 14	300	400
Rs. 15	250	450
Rs. 16	200	500

SELF-ASSESSMENT EXERCISE :

Q 1. Define demand and law of demand. Why does demand curve usually slope downward to the right ?

Q 2. Define supply and its determinants. What do you understand by law of supply?

Q 3. Explain market equilibrium with the help of a diagram.

FURTHER READINGS :

1. Principles of Economics by Prem J. Bhutani.
2. Micro Economics by M.L.Seth.
3. Micro Economics by D.M. Methani.

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Semester - I **LESSON No. 3**

LAWS OF CARDINAL MARGINAL UTILITY ANALYSIS

STRUCTURE

3.1 OBJECTIVES

After going through this unit, you should be able to:

- Understand the laws of cardinal marginal utility i.e. the law of diminishing marginal utility and the law of equi-marginal utility.
- Critically evaluate the laws of cardinal marginal utility.

3.2 INTRODUCTION

Utility means want-satisfying power of a commodity. It is also defined as power of commodities which satisfies the wants of the consumers. It is a subjective entity. The desire for a commodity by a person depends upon the utility he expects to obtain form it. The greater the utility he expects from a commodity, the greater is his desire

for that commodity. It is ethically neutral e.g. the utility of cigarette to a smoker can't be questioned on the basis of morality, as he gets satisfaction out of it.

3.3 BASIC PREMISES OF CARDINAL MARGINAL UTILITY ANALYSIS

Cardinal utility analysis of demand is based upon certain important assumptions. These are:

1. Cardinal Measurement of Utility

The Cardinal Marginal utility analysis assumes that utility is quantifiable in cardinal terms i.e. 1, 2, 3, etc. So it is possible to show how much utility a consumer is getting after consuming a commodity. It is measured in imaginary units called Utils.

2. Utilities Are Independent

The Marginal utility analysis assumes that utilities of different commodities are independent of one another. ie., the utility of one commodity does not in any way affect that of another. So, the total utility of all goods consumed by a consumer is simply the sum total of the separate utilities of all the goods consumed by a consumer. Thus, according to this assumption, the utilities of various goods are additive, i.e., separate utilities of the various goods can be added to obtain the total sum of the utilities of all goods consumed.

3. Constant Marginal Utility of Money

It is assumed that while marginal utility of a commodity varies with the quantity of the commodity purchased, the Marginal Utility of a commodity is measured in terms of money.

It is considered desirable that the measure itself should not keep changing. So if the price of goods falls and the real income of the consumer rises, the marginal utility of money to him will fall but Marshall ignored this and assumed that marginal utility of money did not change as a result of the change in price. Likewise, when the price of a good rises, the real income of the consumer will fall and his marginal utility of money will rise. But Marshall ignored this and assumed that marginal utility of money remains the same. Marshall defended

this assumption on the ground that "his (the individual consumer's) expenditure on anyone thing is only a small part of his whole expenditure." It may be mentioned here that by assuming the marginal utility of money to remain constant as a result of change in price, Marshall ignored the income effect of the price change.

4. Introspection

The Marginal utility analysis also assumes that from one's own experience (judging what happens in one's own mind), it is possible to draw inference about another person. This is self-observation applied to other persons. It is assumed that the mind of men work identically in similar situations.

Given these assumptions, let us now discuss the two laws of Cardinal marginal utility analysis. These laws are:

(1) Law of Diminishing Marginal Utility and

(2) Law of Equi-Marginal Utility.

3.4 LAW OF DIMINISHING MARGINAL UTILITY

Statement of the law:

The law refers to the common experience of every consumer. Suppose a person starts eating a packet of biscuits. The first biscuit gives him great pleasure. The second biscuit meeting with a less urgent want, yields less satisfaction the satisfaction of the third will be less than that of the second; that of the fourth less than that of the third, and so on. The additional satisfaction will go on decreasing with every successive biscuit. It drops down to zero; and if the consumer is forced to take more, the satisfaction may become negative or the utility may change into disutility.

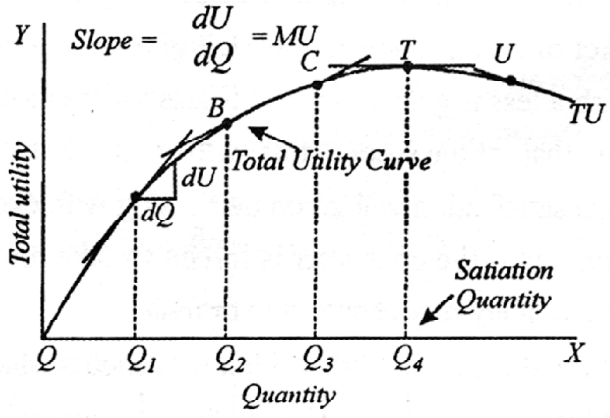
Marshall States the law thus: "the additional benefits which a person derives from a given increase of his stock of a thing diminishes with every increase in stock that he already has". In other words, as a consumer takes more units of a good, the extra utility or satisfaction that he derives from an extra unit of the good goes on falling. It should be carefully noted that it is the marginal utility and not the total utility that declines with the increase in the consumption of a good. The law of Diminishing Marginal Utility means that the total utility increases but at a decreasing rate.

The Table-I presented below shows that when our hypothetical consumer goes on taking biscuits, the extra satisfaction that he gets by the consumption of each successive biscuit goes on decreasing till it goes down to zero at the 6th and then it becomes negative (see colum-3). The total Utility, however, goes on increasing until the consumption of the 5th unit; but it is worth noting that it increases at a diminishing rate.

TABLE –I

UNITS (BISCUITS)	TOTAL UTILITY (UNITS OF SATISFACTION)	MARGINAL UTILITY (UNITS OF SATISFACTION)
1	20	20
2	38	18
3	53	15
4	64	11
5	70	6
6	70	0
7	62	-8
8	46	-16

TOTAL UTILITY AND MARGINAL UTILITY : GRAPHIC REPRESENTATION



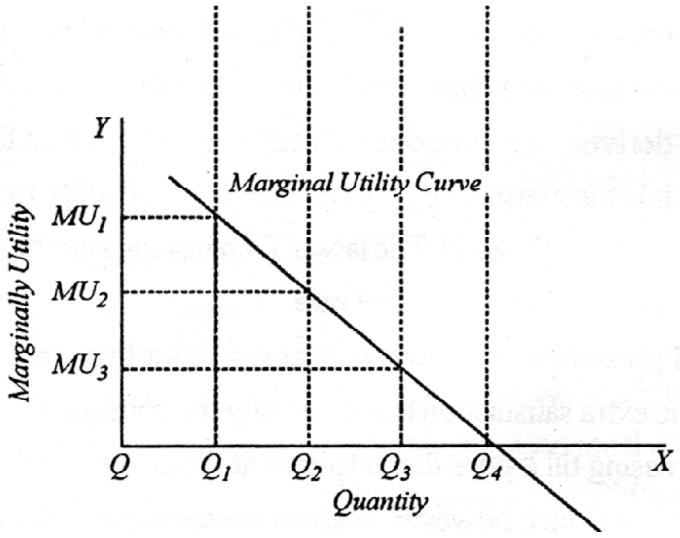


FIG. Law of equi-marginal utility and consumer's equilibrium.

The figure above illustrates the total utility and the marginal utility curves. The total utility curve drawn in the figure is based upon three assumption. First, as the quantity consumed per period increases, the total utility increases but at a decreasing rate. This implies that as the consumption per period of a commodity increases, marginal utility diminishes as shown in the lower panel of the figure. Secondly, as will be observed from the figure that when the rate of consumption of commodity per period increases to Q4 the total utility reaches its maximum level. Therefore, the quantity Q4 of the commodity is called satiation quantity or satiety point. Thirdly, the increase in the quantity consumed of the good per period beyond the satiation point has an adverse affect on the total utility, i.e., the total utility declines if more than Q4 quantity of the good is consumed. This means that beyond Q4, the marginal utility of the commodity becomes negative (as will be seen from the lower panel of figure, beyond the satiation point Q4, the marginal utility curve MU goes below the X-axis indicating that it becomes negative beyond quantity Q4 per period of the commodity consumed.

As we know, marginal utility is the increase in total utility caused by the consumption of an additional unit of the commodity per period. We can directly find out the marginal utility of the successive units of the commodity Consumed by measuring the additional utility which a consumer obtains from successive units of the commodity

and plotting them against their respective quantities. However, in terms of calculus, marginal utility of a commodity X is the slope of the total utility function U=f (qx). Thus, we can derive the marginal utility curve by measuring the slope at various points of the total utility curve TV in upper panel of figure by drawing tangents at them e.g., at the quantity Q_1, marginal utility (i.e. $dU/dQ=MU_1$) is found out by drawing tangent at point A and measuring its slope which is then plotted against quantity Q_1 in the panel below of the figure. In the lower panel we measure marginal utility of the commodity on the Y-axis. Likewise, at quantity Q2 marginal utility of the commodity has been obtained by measuring slope of the total utility curve TV at point B and plotting it in the panel below against the quantity Q2. It will be seen from the figure that at Q4 of the commodity consumed, the total utility reaches at the maximum level T. Therefore, at quantity Q4 the slope of total utility curve is zero at this point. Beyond the quantity Q4 the total utility declines and marginal utility becomes negative. Thus, the quantity Q4 of the commodity represents the satiation quantity.

Another important relationship between total utility and marginal utility is worth noting. At any quantity of a commodity consumed the total utility is the sum of the marginal utilities. For example, if the marginal utility of the first, second, and third units of the commodity consumed are 5, 10 and 5 units, the total utility obtained from these three units of consumption of the commodity must equal to 20 units.

This law is based upon two important facts. First, while the total wants of a man are virtually unlimited, each single want is satiable. Therefore, as an individual consumes more and more units of a good, intensity of his want for the good goes on falling and a point is reached where the individual no longer wants any more units of the good. That is when saturation point is reached marginal utility of a good becomes zero. Zero marginal utility of a good implies that the individual has all that he wants of the good in question. The second fact on which the law of diminishing marginal utility is based is that the different goods are not perfect substitutes for each other in the satisfaction of various particulars wants. If the units of one good can satisfy many wants, the marginal utility from it won't diminish.

3.5 PRACTICAL IMPORTANCE OF THE LAW OF DIMINISHING MARGINAL UTILITY

1. Taxation:

The law of diminishing marginal utility is of great utility in public finance; the progressive system of taxation which means imposing more burden on the rich and less on the poor is based on the law of diminishing marginal utility, as the marginal utility of money is more to a poor person than to a rich.

2. Downward sloping demand curve:

The law of demand is based on the law of diminishing marginal utility. The consumer purchases more units of a commodity only if the price is lowered as higher the stock of a commodity possessed by an individual, lower is the marginal utility of that commodity to the individual.

3. Value-in-use and value-in-exchange:

Free goods like air have great value- in-use i.e. total utility but no value-in-exchange or marginal utility, whereas precious goods like diamond have high value-in-exchange but little value-in-use or total utility. Since price is determined by marginal utility, air is available as a free good and diamond is highly priced.

4. Socialism:

On the basis of this law, the socialists believe that it is desirable to re-distribute the wealth in favor of the poor; the marginal utility of the wealth lost by the rich as a result of redistribution is much less as compared to that of the poor who is going to gain as a result of it.

5. Basis of some economic laws:

Many laws of Economics are based on the law of diminishing marginal utility, e.g., Law of demand, Law of substitution, concept of consumer's surplus, elasticity of demand etc.

3.6 LAW OF EQUI-MARGINAL UTILITY

Every rational person wants to make the best use of resources. This is

necessary because resources are scarce in relation to wants. Every consumer aims at getting the maximum possible satisfaction. According to the law of equi-marginal utility, a consumer would so allocate his limited income on the purchase of various goods that maximizes his level of satisfaction. For this purpose, he will substitute the more useful for the less useful things. The law is known by different names like the Law of substitution, the Law of indifference, the Law of economy of expenditure, or the Law of maximum satisfaction. It is called as the Law of substitution as the consumer substitutes more useful things for the less important ones, given the scarcity of resources. At the point of equilibrium, the consumer is indifferent between the various combinations of different goods and the consumer gets the maximum satisfaction. The marginal utility of money spent on different goods is equalized through the process of substitution.

Let us assume a consumer with limited income to be spent on only two goods X and Y. The prices of X and Y are given for the consumer. According to the law of equi-marginal utility, the consumer will distribute his income between goods X and Y in such a way that the utility derived from the last rupee spent on each good is equal. The marginal utility of the last rupee spent on the good (also called as marginal utility of money expenditure) is equal to the marginal utility of the good divided by the price of that good. MUe=MUx/Px

Here MUe means the marginal utility of money expenditure, MUx is the marginal utility of good X and Px is the price of X. In case of more than one good, the consumer will spend his income on different goods in such a way that the marginal utility of each good is proportional to its price. Suppose there are n goods. The consumer is in equilibrium when MUe= MUx /Px= MUy /Py= MUz /Pz= ••••••• MUn /Pn.

The above equation shows that the consumer will go on substituting one good for the other till the marginal utility of money expenditure on each good is the same. At this point, he gets the maximum level of satisfaction and he is in equilibrium.

Let us explain the law of equi-marginal utility with the help of an arithmetic table.

Table-II Marginal Utilities of goods X and Y

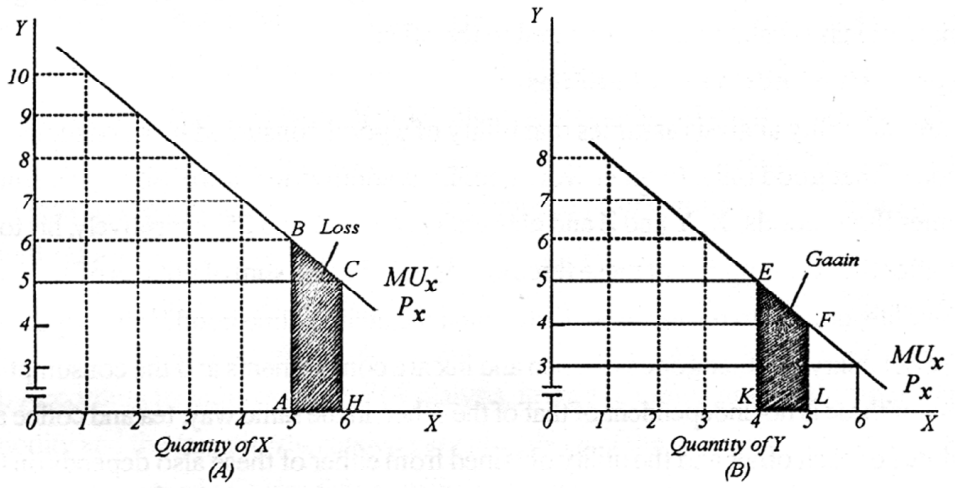
Units	MUx	MUy
1	20	24
2	18	21
3	16	18
4	14	15
5	12	12
6	10	9

Table-III Marginal Utilities of goods X and Y

Units	MUx/Px	MUy/Py
1	10	8
2	9	7
3	8	6
4	7	6
5	6	4
6	5	3

Let the price of X be Rs. 2 per unit and that of Y be Rs. 3 per unit .Let the consumer's income to be spent on the two goods is Rs. 24. The point of consumer's equilibrium is the one where the marginal utility of money expenditure or where the marginal utility of the last rupee spent on these two goods is equal. The above tables show that MUx/Px = MUy/Py =5 utils when the consumer cosumes 6 units of X and 4 units of Y. At this point, the consumer is getting the maximum utility out of his consumption and nothing induces him to move anywhere from this point.

Let us now explain consumer's equilibrium with the help of graphical presentation



The above figure shows that the consumer is in equilibrium when he consumes 6 units of X and 4 units of Y Consumption of one unit less of good X or one unit more of Y will mean loss in total utility. As shown in the figure, consumption of 5 units of X leads to loss in utility equal to ABCH and consumption of 5 units of Y leads to gain in utility equal to the shaded area KEFL. Since the loss in utility exceeds the gain, this rearrangement takes the consumer away from the point of equilibrium. So he will substitute the goods for each other so as to reach his point of equilibrium.

3.7 CRITICAL EVALUATION OF THE CARDINAL MARGINAL UTILITY ANALYSIS:

The cardinal utility analysis of demand has been criticized on the basis of the following grounds:

1. Unrealistic Assumption of cardinal measurability of utility

According to the marginal utility analysis, utility can be measured in absolute, objective and quantitative terms. So the utility of a commodity to a person can be expressed in cardinal terms like, 2, 3 and so on. But according to the critics, it is not quantifiable and varies from person to person i.e. is subjective in nature, utility being a psychic entity. So in real life, the consumer can only order his preferences for the various combinations of goods being enjoyed by him. He can only tell whether a given combination of goods gives him more or less satisfaction as compared to the other.

2. Hypothesis of independent utilities

Cardinal utility analysis assumes that utility of a good consumed by a consumer is a function of that good only. In other words, utility is additive in nature. So if a consumer consumes three goods, X, Y and Z and gets utility of 1 0, 15 and 25 respectively, his total utility after the consumption of these three goods is 50 i.e. the sum of utilities of X, Y and Z. In real life, goods are related to each other and the utility of one good is also dependent on the availability of other goods e. g. pen and ink are complements and the consumption of either of these is not independent of that of the other; in the same way, tea and coffee are substitutes of each other and the utility obtained from either of these also depends on the availability of the other. So the hypothesis of independent utilities is wrong.

3. Assumption of constant marginal utility of money

Another assumption of marginal utility analysis is the constancy of marginal utility of money i.e. the marginal utility of money remains the same irrespective of the level of income or the stock of money available with the consumer. A person spends a part of his money income on the purchase of some commodities; this reduces the money income left with him. So the marginal utility of money income left with him rises. Now suppose the price of a good falls; this raises the real income of the consumer and reduces the marginal utility of the money with him. But Marshall ignored all this and assumed the constancy of marginal utility of money. It is because of this assumption that he could not understand the composite character of the price effect (price effect as a sum of income effect and substitution effect). The assumption of constancy of marginal utility of money along with the hypothesis of independent utilities confines the validity of Marshall's demand theorem to one commodity only.

4. It does not split up the price effect into income and substitution effects

The cardinal utility analysis does not distinguish between income effect and substitution effect of a price change. As we know, if the price of a good falls, it increases the real income of the consumer. So the consumer is now in a position to consume more of this commodity due to income effect of price change. Besides, this commodity becomes relatively cheaper as compared to other commodities; this induces the consumer to substitute this good for the other goods (substitution effect of price change). So as the price of a good rises (or falls), the quantity demanded of it falls

(rises) due to income effect and substitution effect. But the marginal utility analysis can't tell us how much change in the quantity demanded of a commodity is due to income effect and how much due to substitution effect. It is because of the assumption of constancy of marginal utility of money.

5. Cardinal analysis fails to explain Giffen Paradox

Because the cardinal utility analysis holds valid in case of one commodity, it can't explain Giffen paradox and Marshall considered it to be an exception to the law of demand. According to Indifference curve analysis, in case of Giffen goods, the price of the commodity and the quantity demanded vary directly i.e. if the price of a commodity falls, the quantity demanded of it also falls as with the increased real income, the consumer likes to switch over to a superior good. In case of a Giffen good, the negative income effect of price change more than counteracts the substitution effect. Because of the assumption of constancy of marginal utility of money and hence the inability to understand the composite character of price effect, Marshall could not explain Giffen paradox.

3.8 LET'S SUM UP

In this lesson, we discussed the laws of cardinal marginal utility analysis.

- Section 3.2 was introductory in nature in which utility was defined.
- Section 3.3 dealt with the basic assumptions on which cardinal marginal utility analysis is based.
- In section 3.4, the discussion pertains to the Law of Diminishing Marginal utility.
- In Section 3.5, the practical importance of the Law of Diminishing Marginal Utility was discussed.
- Section 3.6 dealt with the Law of Equi-Marginal utility.
- In section 3.7, we critically evaluated the cardinal marginal utility analysis

3.9 RECOMMENDED READINGS

- Ahuja, H.L. Advanced Economic Theory, S. Chand, New Delhi.
- Koutsoyiannis, A, Modern Microeconomics, Macmillan.
- Ray, N. C. An Introduction to Microeconomics, Macmillan Company of India Ltd., Delhi.

Self assessment questions

1. Explain how a consumer attains equilibrium with the help of Marshall's utility analysis.
2. Prove, with the help of a diagram that the total utility is maximum when marginal utility is zero.
3. What are the main shortcomings of cardinal marginal utility analysis?

EC 101

Semester - I **LESSON No. 4**

INDIFFERENCE CURVE ANALYSIS

Objectives :

After studying this lesson, you should be able to :

- Understand the concept of indifference curve and important assumptions on which the philosophy of indifference curves is based; and
- Familiarize yourself with the important properties of indifference curves.

Structure :

4.1. MEANING AND PROPERTIES OF INDIFFERENCE CURVES :

Introduction : The technique of indifference curves was originated by Edgeworth in 1881. It was further developed by Fisher, Pareto and Slutsky. But a detailed study was done by Hicks and Allen in an article, "A reconsideration of the theory of value" in 1934.

5.2.2 MEANING :

An indifference curve is the locus of various combinations which yield the same utility to the consumer so that he is indifferent to a particular combination he consumes.

Indifference Schedules : An indifference schedule is a table representing the various combinations of goods which give equal satisfaction to the consumer.

Two indifference Schedules :

Table 1 :

Schedule I		Schedule II	
Good X	Good Y	Good X	Good Y
1.	12	2	14
2.	8	3	10
3.	5	4	7
4.	3	5	5
5.	2	6	4

We can convert the indifference schedules in to indifference curves by plotting the various combinations. The indifference curves IC_1 and IC_2 in the diagram are drawn by plotting the various combinations of indifference schedules No I and No. II.

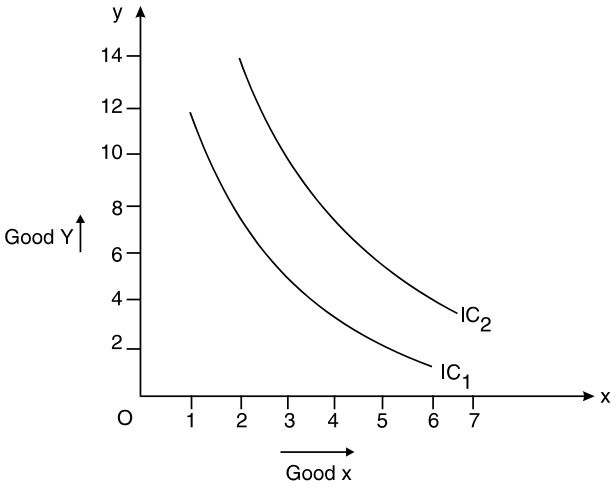


Fig.

Indifference Map :

An indifference map is a geometrical expression of a number of indifference curves. A higher indifference curve shows more satisfaction. Indifference curve no. V i.e IC_5 shows the highest satisfaction and IC_1 shows the least satisfaction in the fig drawn below.

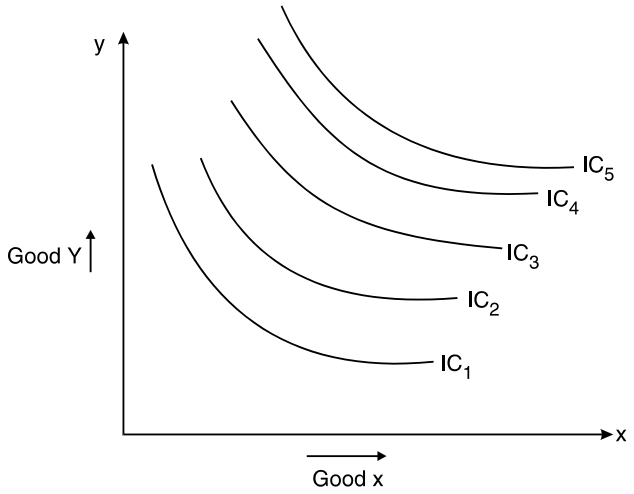


Fig. 5.2

Assumptions :–

I. **Rationality :** A consumer is assumed to be rational. He aims at the maximisation of his utility, given his income and market prices. It is assumed that he has full knowledge of all relevant information.

II. **Utility is ordinal :** It is assumed that the consumer can rank his preferences according to the satisfaction of each basket. He need not know precisely the amount of satisfaction.

III. **Diminishing marginal rate of satisfaction :** Preferences are ranked in terms of indifference curves, which are assumed to be convex to the origin. The slope of indifference curve is called the marginal rate of substitution of the commodities.

IV. The total utility of the consumer depends on the quantities of the commodities consumed.

U= f(q1, q2, q3-------, qx, qy----qn)

V. **Consistency :** It is assumed that the consumer is consistent in his choice. If in one period he chooses bundle A over B, he will not choose B over A in another period if both bundles are available to him. Symbolically, if

A>B, then B>A.

VI. Transitivity of choice : It is assumed that consumer's choices are characterised by transitivity. If bundle A is preferred to B, B is preferred to C then bundle A is preferred to C. Symbolically, if A>B, B>C then A>C.

4.2.4 Properties of indifference Curves :

I. An indifference curve has a negative slope :– An indifference curve slopes downward to the right, which denotes that if the quantity of one commodity decreases, the quantity of the other must increase, if the consumer is to stay on the same level of satisfaction.

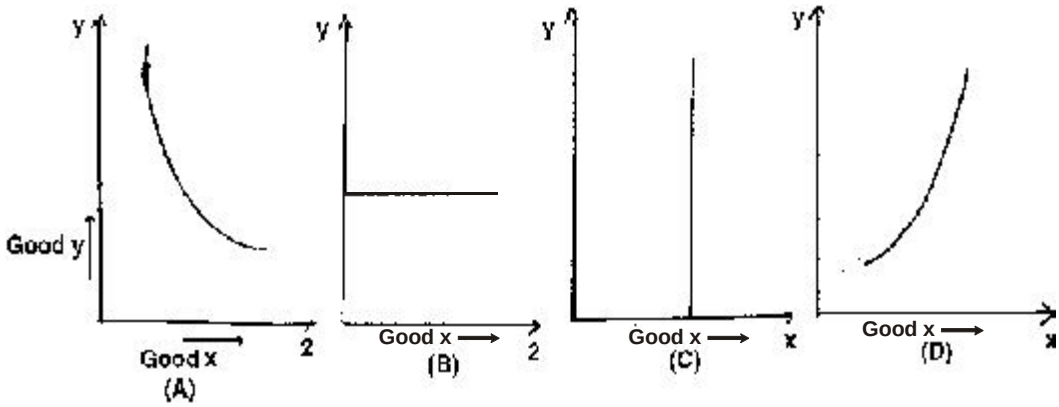


Fig. 5.3

An indifference curve will not take the shape of Fig. (B), (c) or (D). Because in Fig (B) the indifference curve has the shape of horizontal straight line that would mean as the amount of good X was increased, while the good Y remained the same, the consumer would remain indifferent. In Fig. (c), indifference curve had the shape of vertical straight line that would mean as the amount of good Y increased, good X remains the same. In Fig. (d), indifference curve is to slope upward to the right. This means that the amount of both the goods increases as one moves to the right along the curve. These can't be indifference curves.

II. Indifference curves are convex to the origin :– This implies that the slope of an indifference curve decreases as we move along the curve from left

downwards to the right. The MRS of the commodities is diminishing. It means that the indifference curve is convex to the origin. As it is clear from two schedules in table I, as the quanitity consumed of X increases, that of Y has to decrease. But the rate at which Y of will be sacrificed by the consumer decreases. In other words, the MRS xy is decreasing. The reason behind it is that the consumer is expected to consume both the commodities. So Y is reduced at a decreasing rate. Diminishing MRS xy give rise to a convex indifference curve.

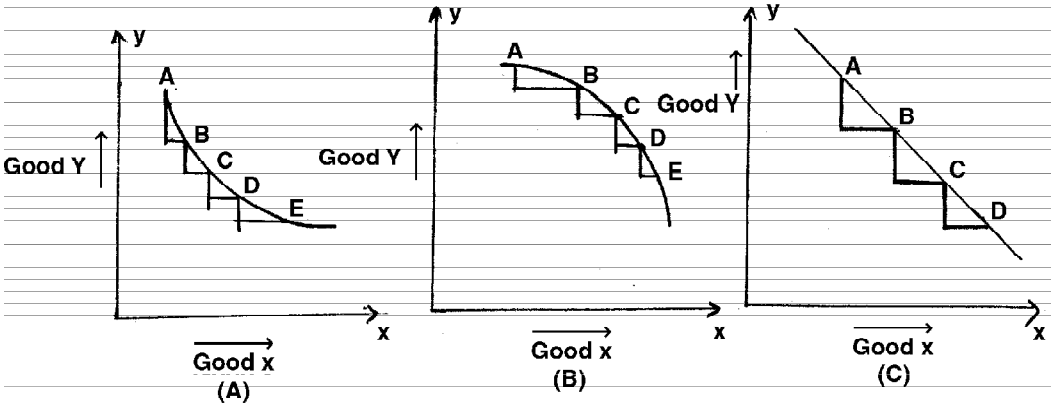


Fig.

So an indifference curve cannot be concave to the origin because it will imply that the MRS of X for Y increases, as more and more of X is substituted for Y (as in fig (B).

Indifference curve cannot be a straight line because this would mean that MRxy remains constant as more units of X are acquired in place of Y as in fig (C). so Fig A is the usual shape of an indifference curve.

III. Indifference Curves cannot intersect each other : If two indifference curves intersect each other, the point of their intersection would imply two different levels of satisfaction, which is impossible.

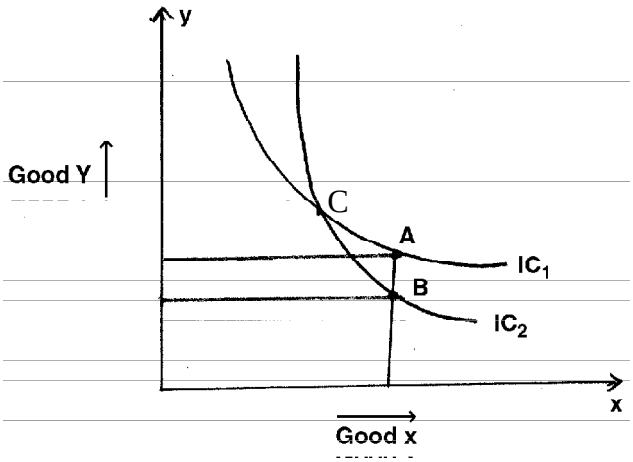


Fig.

In Fig. above two indifference curves IC_1 and IC_2 intersect at point C. Point A and Point B shows equal satisfaction because both are on the same indifference curve IC_2. It follows that combination A will be equivalent to combination B, which is not true.

IV. The further away from the origin an indifference curve lies, higher level of satisfaction it denotes :– An indifference curve that lies above and to the right of another indifference curve represents preferred combinations of commodities and therefore higher levels of satisfaction as in the fig. below

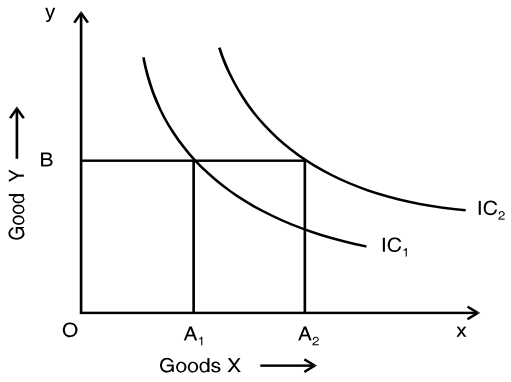


Fig.

In the Fig. IC_2 is a higher indifference curve, as compared to IC_1, as $A_2 > A_1$ with the same amount of commodity B.

V. Indifference curves may not be parallel to each other : Indifference curves may be parallel or may not be parallel to each other. They are parallel to each other if the two commodities are independent in the sense that they are neither substitute nor complement to each other.

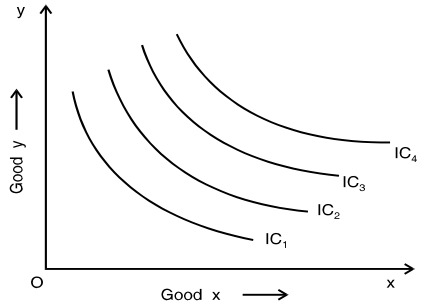


Fig. V

VI. An Indifference curve does not touch the horizontal or the vertical axis: If the indifference curve touches horizontal or vertical axis as in the fig. below, then it means the consumer is purchasing only one commodity, which is wrong.

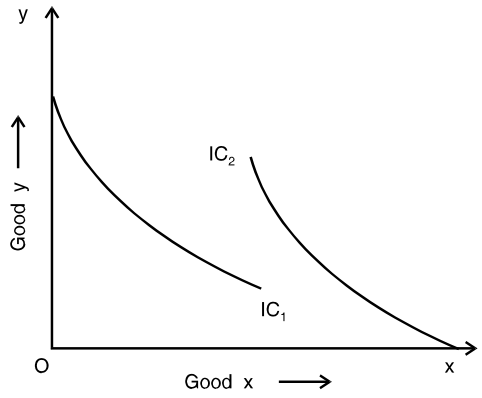


Fig.

SELF-ASSESSMENT EXERCISE

Q 1. Distinguish between cardinal and ordinal utility. Which is more realistic ?

Q 2. Do you agree that ordinal measurement of utility approach is superior to cardinal measurement of utility approach ? If yes, discuss ?

Q 3. What are indifference curves ? What are the assumptions on which indifference curve analysis of demand is based ?

Q 4. What are the properties of indifference curves ? Explain fully.

Q 5. Explain why consumer's indifference curves (i) have negative slope, (ii) do not intersect and (iii) are convex to the origin.

FURTHER READINGS

Micro Economics by D.N. Dwivedi

Economic theory-Micro Analysis by D.M. Methani

Principles of Economics by Prem J. Bhutani

Modern Microeconomics by A. Koutsoyiannis.

EC 101

Semester - I **LESSON No. 5**

CONSUMER'S EQUILIBRIUM THROUGH AN INDIFFERENCE CURVE

Objectives :

After going through this lesson, you should be able to :

- Understand the concept of indifference map and budget line;
- Determine the equilibrium of the consumer on an indifference curve;

Structure :

5.1.0 EQUILIBRIUM OF THE CONSUMER ON AN INDIFFERENCE CURVE :

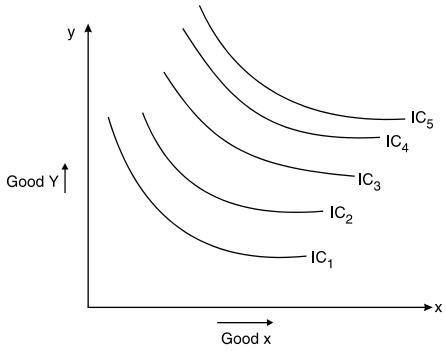
5.1.1INTRODUCTION :

A consumer is in equilibrium when he obtains the maximum satisfaction from his expenditure on the commodities he wants to purchase. To show equilibrium on an indifference curve we should have indifference map and the budget line.

5.1.2 INDIFFERENCE MAP :

An indifference map is a geometrical expression of a number of indifference

curves. A higher indifference curve shows more satisfaction. As shown in the diagram (below), Indifference Curve No. IC5 shows highest satisfaction and IC1, the least satisfaction.



5.1.3 BUDGET OR PRICE LINE :

The consumer has a given income and income acts as a constraint in the consumer's ability to purchase the two commodities. If the income increases budget line shifts upward from P_L to P_1L_1. The slope of the price line is given by ratios of the prices of the two commodities i.e. PX/Py.

A budget line shows the different combinations of the goods X & Y which the consumer can purchase given the price of the two goods and the income of the consumer e.g. PL budget line shows two extremes P & L. Point P shows that only commodity Y has been punchased, where as point L shows that the whole income has been spent on the purchase of good X. Between these two extremes, lie various combination of goods X and Y.

Apart from a parallel shift, there can also be non-parallel shift. If there is a decrease in the price of X, budget line shifts from PL to PL_1. On the other hand if the price of Y decreases, the budget line shifts to from PL to P_1L

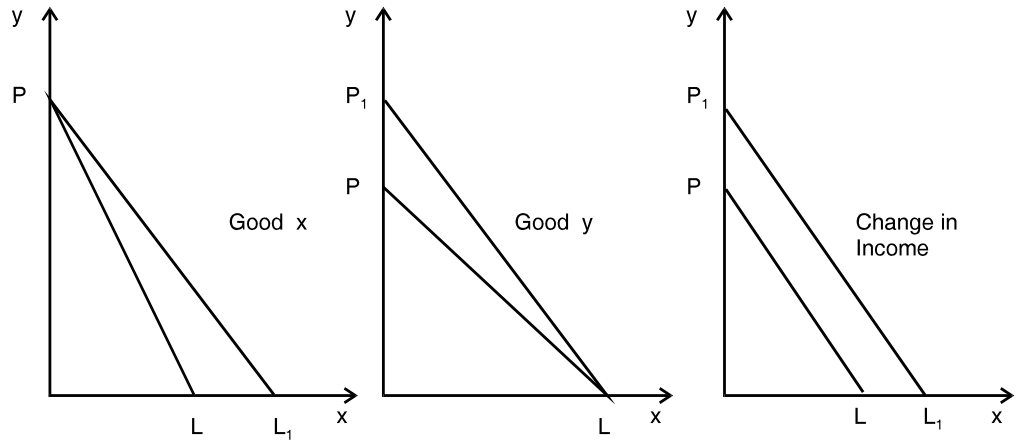


Fig. 6.3 (3)

5.1.4 EQUILIBRIUM OF THE CONSUMER :

The consumer is in equilibrium, when he maximises his utility, given his income and the market prices. Two conditions must be fulfilled for the consumer to be in equilibrium :

(1) The first condition is that the MRS be equal to the ratio of commodity prices or indifference curve must touch the budget line *i.e.*

$$MRS\ xy = \frac{Px}{Py}$$

This is a necessary but not sufficient condition for equilibrium.

(2) The second condition is that the indifference curve must be convex to the point of intersection i.e., the Indifference cruve must be tangent to the budget line at the point where the Indifference curve is observing Diminishing Marginal rate of substitution.

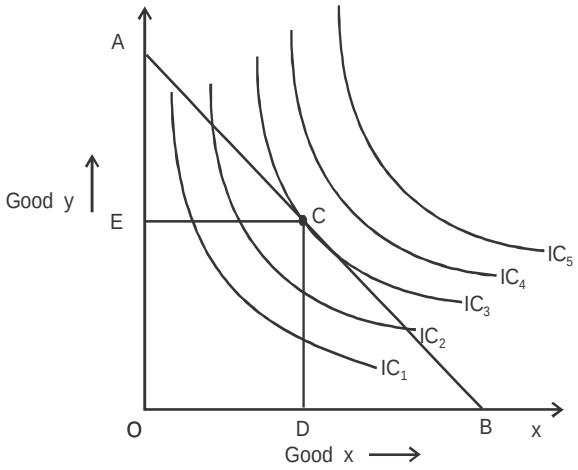


Fig. showing consumer equilibrium

Given the indifference map of the consumer and his budget line, C is the equilibrium point where the budget line touches the highest possible indifference curve. At the point of tangency, the slope of the budget line AB and that of the indifference Curve No. IC_3 are equal. At this point, the consumer gets the maximum level of satisfaction.

SELF ASSESSMENT EXERCISE

Q 1 What is a budget line? Explain fully.

Q 2 What is indifference map? Is it useful to determine equilibrium of the consumer on an indifference curve?

Q 3 Show how a consumer reaches equilibrium on his indifference map, his income and price of commodities being given

FURTHER READINGS :

Economic theory Micro Analysis by D.M Mithani

Modern Economic Theory by K.K Dewett

Modern Microeconomics by A. Koutsoyiannis

ELASTICITY OF DEMAND-PRICE, INCOME AND CROSS

Objectives :

After going through this lesson, you will be able to :

- Explain the concept of elasticity of demand and its types; and
- Describe methods of the measurement of price elasticity of demand and their implications.

Structure :

6.1.0 MEANING AND TYPES OF ELASTICITY OF DEMAND

6.1.1 INTRODUCTION :

The concept of elasticity of demand is generally associated with the name of Alfred Marshall, though actually economists evolved this idea much before Marshall.

6.1.2 MEANING :

We know that when price of the good falls, its quantity demanded extends and when the price of the good rises, its quantity demanded contracts. This is known as law of demand. This law shows only the direction of change in quantity demanded in response to a change in price. This does not tell by how much or to what extent the quantity demanded changes in response to a change in price. This information as to how much or to what extent the amount demanded of a commodity will change as a result of a change in its price is provided by the concept of elasticity of demand.

Suppose there are two commodities; common salt and T.V sets and their prices are cut down by 10%. It does not mean that the quantities demanded of these commodities will increase by the same percentage. The quantity demanded of salt may increase by 2% while that of T.V. sets by more than 10% Thus, the demand for some commodities are more responsive to a given change in price than others. Elasticity of demand may therefore, be defined as the extent of which the quantity demanded of a commodity changes in response to a given change in price of some related commodities or changes in consumer's income. It is the responsiveness or sensitiveness of demand to change in price.

Definitions :

According to Marshall, "the elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in the price and diminishes much or little for a given rise in price."

According to stonier and Hague, "Elasticity of demand is therefore, a technical term used by the economists to describe the degree of responsiveness of the demand for a commodity to a fall in its price."

7.1.3 FACTORS INFLUENCING ELASTICITY OF DEMAND :

1. Nature of commodity
2. Availability of substitutes

3. Number of uses
4. Consumer's income
5. Proportion of consumer's income spent on the commodity.
6. Durability of the commodity
7. Influence of habit and custom
8. Complementary goods
9. Time
10. Possibility of postponement.

6.1.4 IMPORTANCE OF ELASTICITY OF DEMAND :

1. To Businessman,
2. To the govt and Finance Minister,
3. In international trade,
4. To policy makers,
5. To trade unionists,
6. In Determination of the rate of foreign exchange,
7. Determination of rewards for factors of production.
8. Declaration of certain industries as 'public utilities'.

6.1.5 PRICE ELASTICITY OF DEMAND :

Price elasticity of demand implies the response of quantity of a good to change in its price, given the consumer's income, his tastes and prices of all other goods. It is a measure of the relative change in quantity demanded of a good in response to a relative change in its price. Alfred Marshall was the first economist to give clear formulations of price elasticity. It is ratio of proportionate changes in the quantity demanded of a commodity to a given proportionate change in its price. It is the ratio of a relative change in quantity demanded to relative change in price. Let us suppose that E stands for elasticity then,

$$E = \frac{\text{Relative change in quantity}}{\text{Relative change in price}}$$

If the percentage change in price is known, then the numerical size of E can be easily calculated. Let us suppose that the % are 3 for quantity and I for price and that the price falls. Since it falls, the price changes by minus 1% then,

$$E = 3\% = \frac{-3}{-1\%}$$

Let us suppose now that price rises by 1% and the quantity demanded falls by 3%. The quantity change is -3% . Then,

$$E = \frac{-3}{1} = -3$$

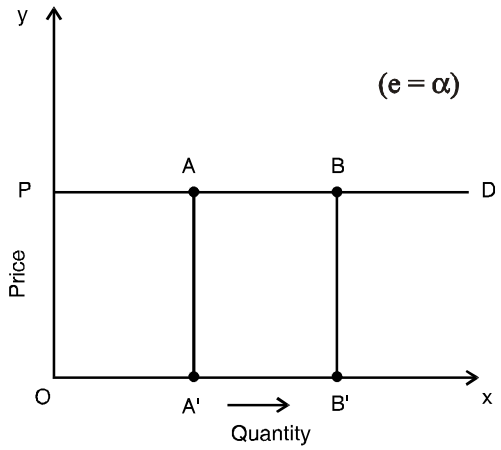
Hence E is always negative, the minus sign can be omitted.

Classification / Degrees of price elasticity of Demand

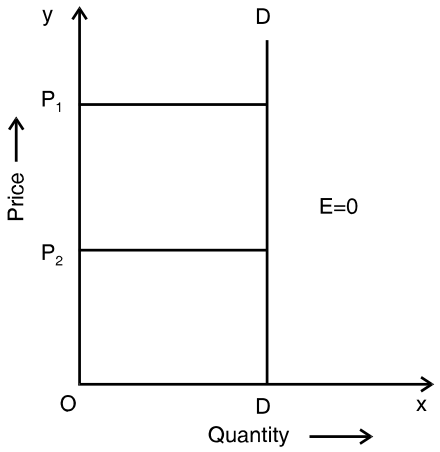
Price elasticity of demand is generally classified under five sub-heads :-

1. Perfectly elastic demand
2. Perfectly in elastic demand
3. Relatively elastic demand
4. Relatively inelastic demand
5. Unitary elastic demand

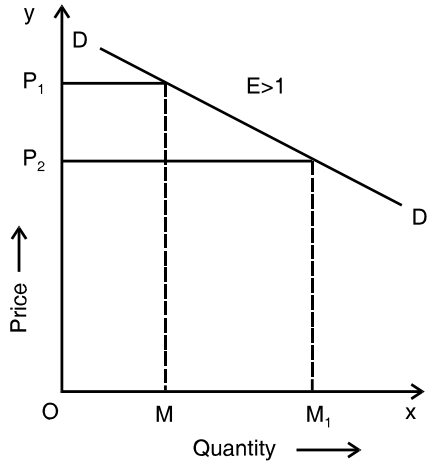
I. Perfectly elastic demand : It refers to that situation where the slightest rise in price causes the quantity demanded of the commodity to fall to zero and the slightest fall in price causes an infinite increase in the quantity demanded of the commodity. The cases of perfectly elastic demand are very rare in actual life. The elasticity of demand is infinity ($e = \alpha$).



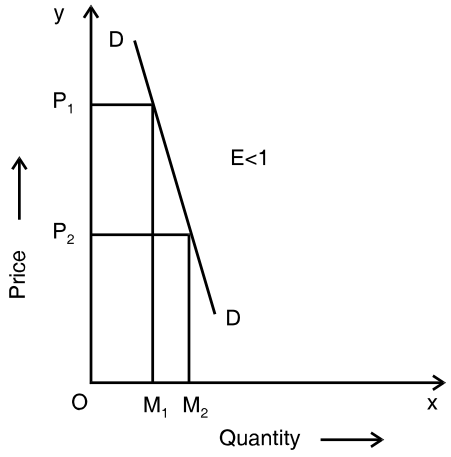
II. Perfectly Inelastic Demand : It refers to that situation where even substantial changes in price leave the demand unaffected. It means price may rise or fall, but the quantity demanded of the commodity remains unchanged. In this case, elasticity of demand is zero. Like perfectly elastic demand, the cases of perfectly in elastic demand are also rare in actual life. Here, the elasticity of demand is zero.



III. Relatively Elastic Demand : It refers to that situation where a smaller proportionate change in price of a commodity is accompanied by a larger proportionate change in its quantity demanded. Elasticity of demand is said to be greater than unity. We find this type of elasticity in case of superior goods.



IV. Relatively In elastic Demand : It refers to that situation where a large proportionate change in price of a commodity is followed by a smaller proportionate change in its quantity demanded. Elasticity is less than unity. We find this type of elasticity in case of inferior and goods necessities of life.



V. Unitary Elastic Demand : It refers to that situation where a given proportionate change in price is followed by an equally proportionate change in the quantity demanded. Elasticity is equal to unity. This type of elasticity of demand is in case of normal goods.

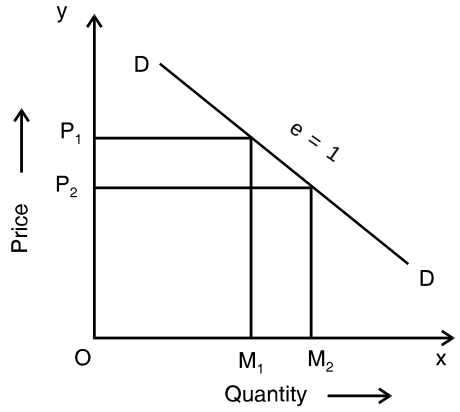


Fig No. 7.5

A demand curve does not have the same elasticity along its course. But there are three exceptions i.e., perfectly elastic, perfectly inelastic and unitary elastic demand curves. In these cases, the demand curve has the same elasticity throughout its length. In perfectly elastic, it is infinity ($e = \alpha$) in perfectly inelastic e=0; and in case of unitary elastic demand curve e=1.

6.1.6 INCOME ELASTICITY OF DEMAND :

Income elasticity of demand for a commodity shows the extent to which a consumer's demand for that commodity changes as a result of a change in his income. It may be defined as the ratio of proportionate change in the quantity demanded of the commodity to given proportionate change in the income of the consumer. The income elasticity of demand can be measured by the formula:-

$$Ei = \frac{\text{Proportionate change in quantity demanded of the commodity}}{\text{Proportionate change in the income of the consumer.}}$$

It follows that income elasticity of demand for a commodity will be high, if a given proportionate change in income of the consumer is accompanied by a proportionately much larger increase in the demand for that commodity e.g if consumer's income rises by 1% and the quantity demanded rises by 5%, then

income elasticity of demand will be 5/1 = 5.

Likewise, income elasticity of demand for a commodity will be low, if 5 % increase in consumer's income is followed by an increase of 1% in the demand for that commodity then Ei = 1/5 = 1/5 = 0.2 Changes in the consumer's money income and his expenditure on any commodity are in the same direction. It means Ei is always positive.

Classification Degrees of Income elasticity of demand

1. Zero income elasticity of demand.
2. Negative income elasticity of demand.
3. Unitary income elasticity of demand.
4. Income elasticity of demand greater than unity.
5. Income elasticity of demand less than unity.

1. **Zero income elasticity of demand :** This refers to the situation where a given increase in consumer's money income does not result in any increase of the quantity demanded of the commodity. Symbolically, zero income elasticity of demand is expressed as Ei = 0.

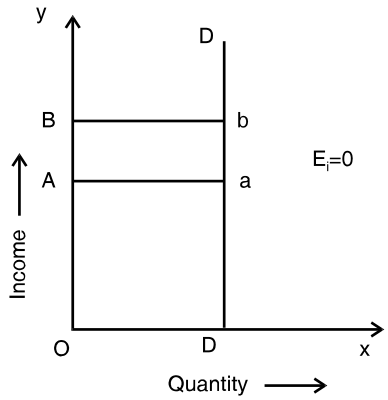
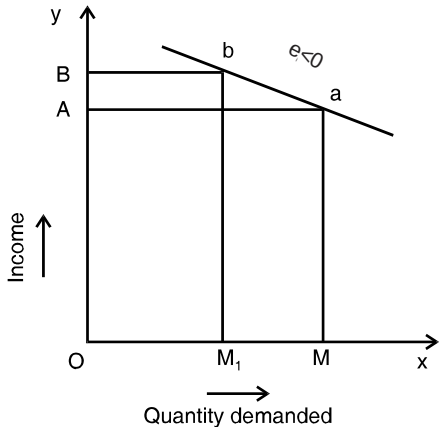


Fig.

2. **Negative income-elasticity of demand :** This refers to that situation where a given increase in the consumer's money income is followed by an actual fall in the quantity demanded of the commodity. This happens in

case of economically inferior goods. Symbolically, negative income elasticity of demand is expressed as Ei <O.



Fig

3. **Unitary income-elasticity of demand :** This refers to the situation where the proportion of the consumer's income spent on the commodity in question is exactly the same both before and after the increase in income. Symbolically income elasticity of demand is expressed as Ei=1 Housing is best example of this type because a considerable portion of income is spent on housing.

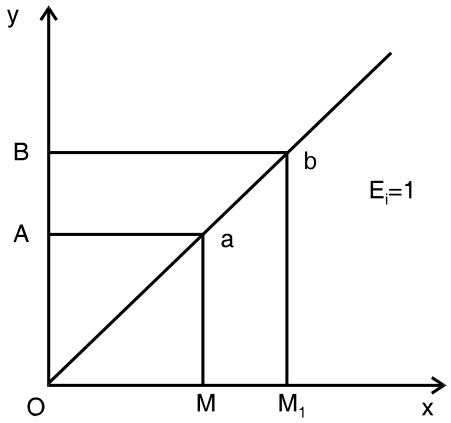


Fig No.

4. **Income elasticity of demand greater than unity :** This refers to the

situation where the consumer spends a greater proposition of his money income on the commodity in question, when he becomes richer and more prosperous. The income elasticity of demand is greater than unity in case of luxuries. Symbolically, it is expressed as $E_i>1$.

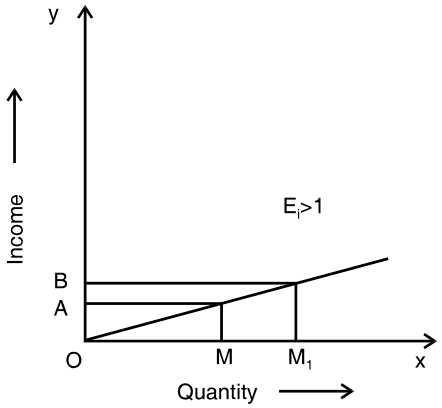


Fig. 7.9

Income elasticity of demand less than unity : This refers to the situation where the consumer spends a smaller proportion of his money income on the commodity in question when he becomes more richer and more prosperous. The income elasticity of demand is less than unity in the case of necessities. Symbolically, it is expressed as Ei <1.

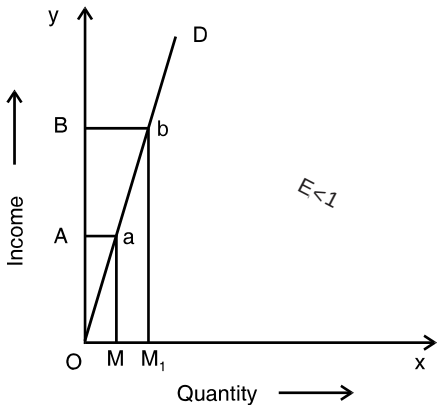


Fig. 7.10

7.1.7 CROSS ELASTICITY OF DEMAND :

The idea of elasticity of demand can also be applied in a situation where two commodities are related to each other in some way. The relation between the two commodities X and Y can be either as substitutes or complementary or completely independent i.e unrelated to each other. Let us take first two types of relationships. The term cross elasticity of demand may be defined as the ratio of proportionate change in the quantity demanded of commodity X to a given proportionate changes in the price of the related commodity Y.

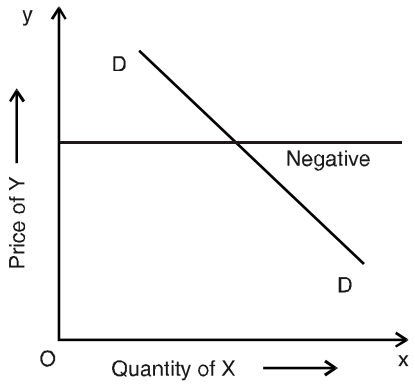
$$\text{C.E. of demand} = \frac{\text{Percentage change in qt. d. of X}}{\text{Percentage change in the price of Y}}$$

Cross elasticity in case of substitutes : Let us assume that two commodities X and Y are substitutes of each other. Now if the price of Y increases assuming that the price of X remains constant, the quantity demanded of X will increase because the consumer will substitute X for Y. On the contrary, if the price of Y falls, assuming that the price of X remains constant, the quantity demanded of X will decrease because the consumer will substitute Y for X. Now if X and Y are perfect substitutes for each other, the cross elasticity of demand will be infinity. It means that the slightest change in the price of Y will cause substitution change in the quantity demand of X. A slight rise in the price of Y will reduce the demand for Y to almost zero. If the two goods are not substitutes at all, the cross elasticity of demand will be zero.

Thus, in the case of substitute goods, the cross elasticity of demand varies between two extremes, infinity and zero depending upon the degree of substitutability existing between them. The value is high in case of close substitutes and low in case of remote substitutes. As the price of Y and quanity demanded of X move in same direction, cross price elasticity takes a positive sign.

Fig.

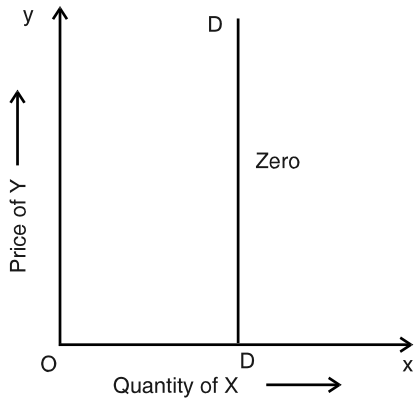
Cross elasticity of demand in case of complementary goods : Let us assume that the commodities X and Y are complements. The cross elasticity in such a case will be negative. A rise in the price of Y will mean not only a decrease in the quantity demanded of Y but also that of X because both are demanded together. It is a case of joint demand. The cross elasticity in case of jointly demanded commodities is negative e.g. in case of cars and tyres.



Fig

Cross elasticity of demand in case of independent goods : Let us

assume that the commodities X and Y are independent to each other. Then a rise or fall in the price of Y does not affect the quantity demanded of X at all.



Fig

The concept of cross elasticity of demand is often used to define the frontiers of an industry i.e; if the cross elasticity of demand between two goods is very high, the two goods belong to the same industry. Cross-elasticities, thus, lay down the boundaries of industries.

6.1.8 MEASUREMENT OF ELASTICITY OF DEMAND :

Total Outlay Method : This method is also known as expenditure method. Alfred Marshall has given this method. In this method, we consider the change in price and the consequent change in the outlay on the purchase of the commodity. If a given change in price does not cause any change in the total amount of money spent on the commodity, elasticity of demand is said to be equal to unity. If, as a result of fall in price, the total outlay is increased, elasticity of demand is said to be greater than unity. If, on the contrary, as a result of a fall in price, the total outlay is diminished, the elasticity of demand is said to be less than unity. These relations can be explained with the help of demand schedules. This is shown in the table I below, which contains three demand schedules. Each schedule has the same prices schedule but the quantities are different.

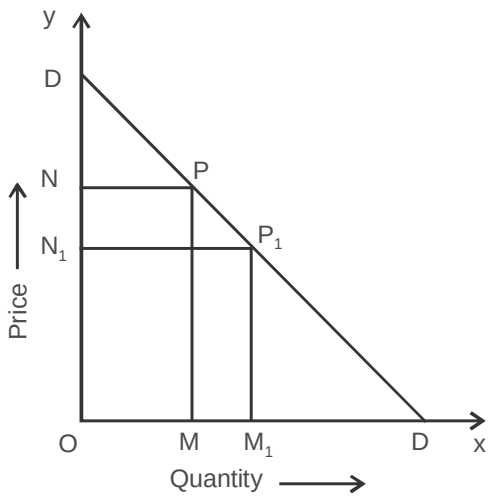
Table I

Demand schedules with different elasticity's elastic demand unit elastic demand inelastic demand

I e>1			II e=1			III e<1		
P Rs.	Q units	PQ Rs.	P Rs.	Q units	PQ Rs.	P Rs.	Q units	PQ Rs.
10	1,000	10,000	10	900	9000	10	1000	10,000
9	2,000	18,000	9	1,000	9000	9	1000	9,000
8	3,000	24,000	8	1,125	9000	8	1000	8,000

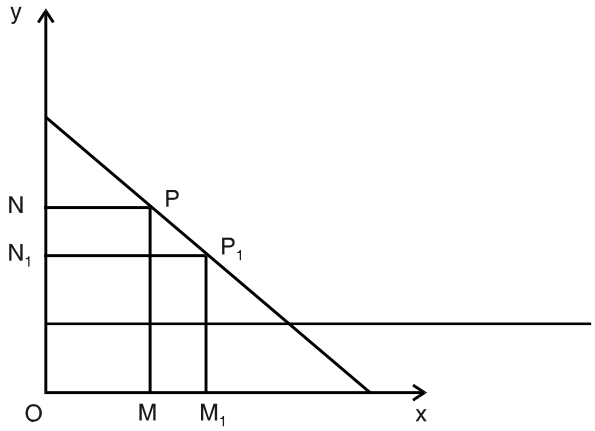
Diagrammatical Explanation :

Elastic demand : In the diagram below, PM is the original price and OM is the original quantity demanded. The original outlay is OMPN. P_1M_1 is the new price and OM_1 is the new quantity demanded. The new outlay is OM_1 PN_1. The new outlay is greater than the original outlay. The elasticity of demand is therefore greater than unity.



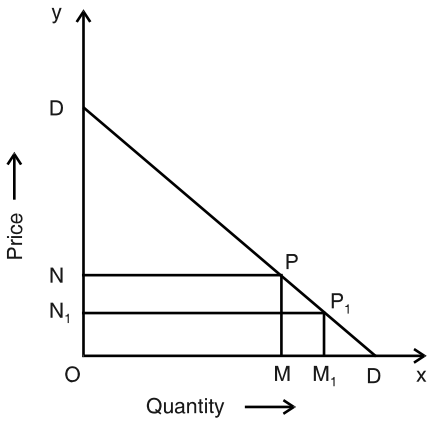
Unitary Elastic demand : In the diagram below, the original outlay is OMPN and new outlay is OM_1 P_1N_1. The quantity demanded has increased as a result of

fall in price. But the new total outlay $OM_1 P_1N_1$ is the same as the original outlay, OMPN Elasticity of demand is therefore, equal to unity.



Fig

Inelastic demand : In the diagram below, the new outlay $OM_1 P_1N_1$ is smaller than the original outlay OMPN. The elasticity of demand is therefore, less than unity.

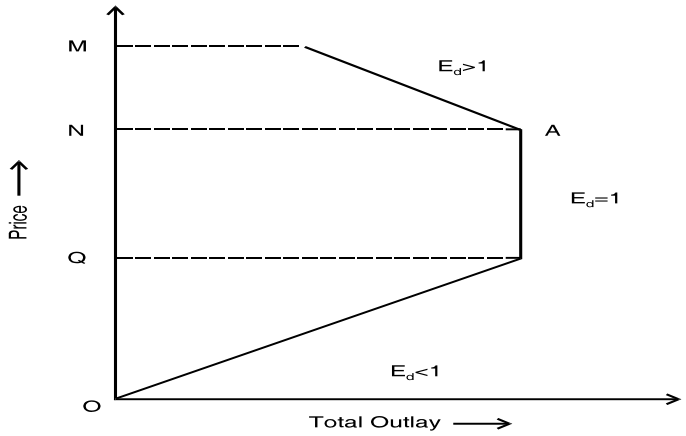


Fig

We can show all the three elasticities by using a single diagram. When the change in total outlay is negative, elasticity is less than unity. When the change in total outlay is zero, elasticity is equal to unity and when the change in total outlay is positive, elasticity is greater than unity.

In the diagram below we have shown the total outlay curve. We have taken three different price ranges from OM to ON, from ON to OQ and all prices below OQ. When the price falls from OM to ON, the total outlay increases, thus elasticity of demand in this case is greater than unity or the demand is elastic; Over the price range ON to OQ, total outlay is parallel to OY, showing unitary elastic demand; in the price range OQ, the total outlay diminishes as price falls, so elasticity of demand is less than unity and demand is inelastic.

The main weakness of the total outlay method is that it does not help us to measure elasticity in numerical terms. It simply classifies price demand into elastic, inelastic and unitary elastic demand.



Geometrical Method or Point Elasticity

Point Elasticity Method

Alfred Marshall also suggests this method of measuring price elasticity of demand. According to this method, we take a straight demand line joining the two axes and measure the elasticity between two points Q and Q' which are assumed to be infinitely close to each other.

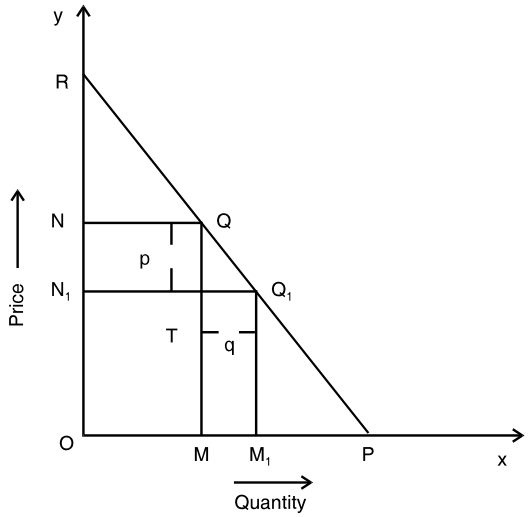


Fig.

In this diagram RP is the straight-line demand curve which connects both the axes. At the original price QM, the quantity demanded is OM. When the price changes to Q_1M_1, the new quantity demanded is OM_1. The symbol p represents the change in price while the symbol q shows the change in quantity demanded. Then,

$$E_d = \frac{\text{Percentage change in Quantity Demanded}}{\text{Percentage change in Price}}$$

$$= \frac{\dfrac{\text{Change in Quantity Demanded}}{\text{Initial quantity demanded}}}{\dfrac{\text{Change in Price}}{\text{Initial Price}}} = \frac{\dfrac{\triangle q}{q}}{\dfrac{\triangle p}{p}} = \frac{\triangle q}{q} \times \frac{p}{\triangle p}$$

$$E_d = \frac{MM_1}{OM} \times \frac{ON}{NN_1}$$

$$= \frac{MMI}{NNI} \times \frac{ON}{OM}$$

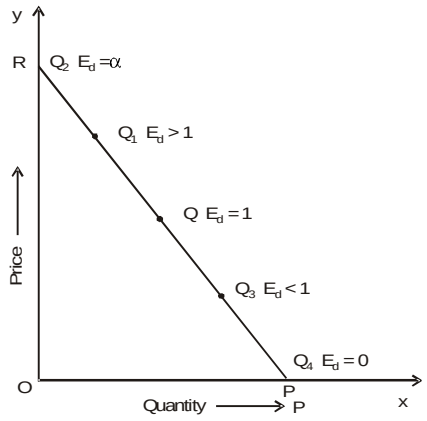


Fig.

Point elasticity of demand :– On a straight line, elasticity is different at different points. Elasticity at one point is the ratio of the lower part of the straight line to the upper part. When elasticity is measured at one point, it is called point elasticity of demand. In diagram above, RP is the straight line demand curve which is 5cm long. Q is the midpoint on the RP curve. Applying the formula,

$$ed = \frac{QP}{RQ} = \frac{2.5}{2.5} = 1$$ or unity.

likewise, it will be different at different points

Even if the demand curve is not a straight line, the above formula will apply. A tangent will have to be drawn at the point on the curve where elasticity is to be measured. It is illustrated in the diagram below

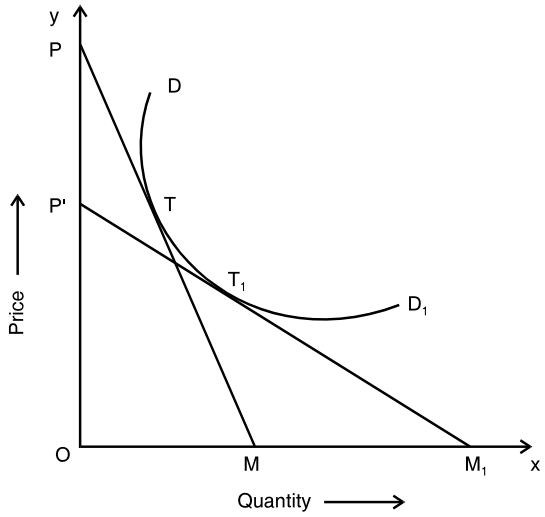
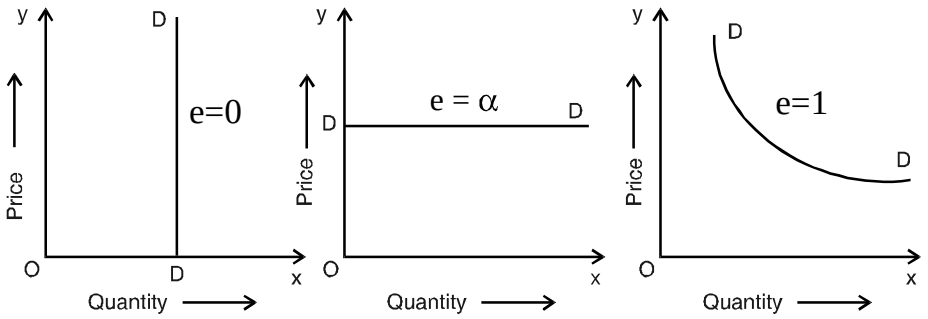


Fig. 7.21

DD' is the demand curve and the two tangents PM and P'M' are drawn respectively at the points T and T'. At point T, elasticity will be equal to $\frac{TM.}{TP}$ At Point T' elasticity will be $\frac{T^1M^1}{T^1P^1}$ clearly elasticity at T is greater than elasticity at T'.

The point method of measuring elasticity is very useful to the economists. It helps them to measure price elasticity when there are very minute changes in the price and quantity demanded of the commodity. Besides, point method also tells us that slope and elasticities are two different things. There are only three kinds of curves in which elasticity of demand will be the same throughout the length of the curves. These are when the demand curve runs parallel to the Y axis, when it is parallel to X axis and when the slope of the demand curve is rectangular hyperbola.



(A) **(B)** **(C)**

Fig. No. 7.22

Proportional Method :– This method is also known as Mathematical method. Under this method, we measure elasticity by comparing the percentage change in price with the percentage change in demand. The elasticity of demand is unity, greater than unity or less than, unity. Accordingly the change in demand is proportionate, more than proportionate or less than proportionate to the change in price respectively. The elasticity is the ratio of the percentage change in the price changed. The formula is :

$$E = \frac{\text{Proportionate change in demand}}{\text{Proportionate change in price}}$$

$$= \frac{\text{Change in demand}}{\text{Initial amount demanded}} \div \frac{\text{Change in price}}{\text{Initial Price}}$$

This formula can be better understood with the help of mathematical illustrations:–

Suppose apples are selling at a price Rs. 10 per kg and a consumer demands 15 kgs of apples at this price. After sometime, the price falls to RS. 8 per kg and the consumer demanded 20 kg of appples and then elasticity is

$$\frac{Q_2 - Q_1}{Q_1} \div \frac{P_2 - P_1}{P_1} = \frac{20 - 15}{15} \div \frac{10 - 8}{10}$$

$$\frac{5}{15} \times \frac{10}{2} = \frac{5}{3} = 1.6, \text{ So } e > 1$$

Now, let us take an example of low elasticity. Suppose that the demand of common salt is 5 Kg per month when the price is Rs 2 per kg. Now suppose that its price is doubled from Rs. 2 to Rs. 4 and only 4 kgs is demanded then elasticity is

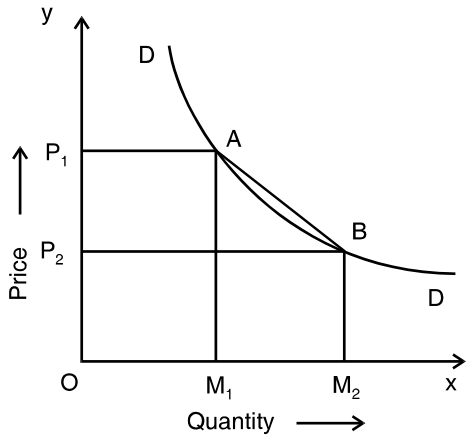
$$\frac{Q_2 - Q_1}{Q_1} \div \frac{P_2 - P_1}{P_1} = \frac{5 - 4}{5} \div \frac{4 - 2}{2}$$

$$= \frac{1}{5} \div \frac{2}{2} = \frac{1}{5}, \text{ So } e < 1$$

So we can say that when the proportionate change in price and the consequent proportionate change in demand are equal, elasticity will be unity, when the proportionate change in demand is greater than the price, the elasticity will be greater than unity and vice- versa.

Arc Method :– The main drawback of the point method is that it is applicable only when we possess information about the minutest changes in the price and the quantity demanded of the commodity. Actually, in real life, we do not possess such information about the minute changes in price and quantity. We may come across demand schedules in which there are big gaps in price as well as the quantity demanded, then we can use arc method of measuring elasticity of demand.

This method uses the midpoints between the old and new points in the case of both price and quantity demanded. The arc method studies a portion or a segment of the demand curve between the two points. Arc elasticity is the elasticity at the midpoint of an arc of a demand curve. An arc is a position of a curved line. In the diagram below, the demand curve DD has two points on it showing the price OP1 and OP2 at which the amounts demanded of commodity are OM1 and OM2 respectively. The two points are so much distant from each other that the



point elasticity formula will not yield the correct measure of price elasticity. This is because the point elasticity formula takes into consideration the straight line joining the two points rather than the arc along the demand curve. The formula for measuring arc elasticity is :–

$$\frac{\Delta Q}{\Delta P} X \frac{\frac{P1 + P2}{2}}{\frac{Q1 + Q2}{2}} = \frac{\Delta Q}{\Delta P} X \frac{P1 + P2}{Q1 + Q2}$$

Example :– Suppose that the price of a commodity is Rs. 5 and the quantity demanded at that price is 100 units. Now assume that the price of the commodity falls to Rs. 4 and the quantity demanded rises to 110 units.

$$Ed = \frac{110 - 100}{5 - 4} X \frac{9}{210} = \frac{-10}{1} X \frac{9}{210} = \frac{-9}{21}$$

(The negative signs may be omitted)

The major advantage of using Arc elasticity lies in cases where changes in price and demand are larger than what is assumed in the point elasticity method. Though the arc elasticity formula can be used for a change in price, which is finite, yet it should not be very large.

SELF ASSESSMENT EXERCISE :

Q 1. What is elasticity of demand? What factors determine it ?

Q 2. Define price elasticity of demand and what are its kinds ?

Q 3. Explain income elasticity of demand and its kinds.

Q 4. Explain the concept of cross elasticity of demand.

Q 5. Explain total outlay method for the measurement of price elasticity of demand as given by Dr. Marshall.

Q 6. How would you measure price elasticity of demand at a point on a linear demand curve?

Q 7. Define price elasticity and measure it by using Arc method or Proportional method?

FURTHER READINGS :

Advanced Economic Theory by	H.L. Ahuja
Principles of Economics by	M.L. Seth
Micro Economics by	D.N. Dwivedi.

EC 101

Semester - I **LESSON No. 7**

CONSUMER'S SURPLUS

Objectives :

After going through this lesson, you should be able to :

- define consumer's surplus and show it diagrammatically;
- do an analysis of consumer's surplus

Structure :

7.1.0 CONSUMER'S SURPLUS

7.1.1 INTRODUCTION :

The concept of consumer's surplus was invented by a French engineer A.J. Dupuit in 1844. But the concept was fully developed and was brought into use by Prof. Alfred Marshall.

7.1.2 MEANING :

Acording to Prof. Marshall, " the excess of the price which a consumer would be willing to pay rather than go without the thing, over that which he actually does pay" According to Penson," the difference between what we would pay and what we have to pay is called the consumer's surplus."

Marshall pointed out that we use many goods in our daily life which are of great importance to us. We get much satisfaction by consuming them. When we spend money for purchasing goods, we make sacrifice. The amount of satisfaction derived by the consumer generally exceeds the amount of sacrifice he makes. This excess is called consumer's surplus. For example, a person is ready to pay Rs. 500/- for a ticket to a cricket match but he pays only Rs. 200/- the actual price of the ticket. So he has a consumer surplus of Rs. 300/-.

Assumptions :–

I) Market price is given :– It is assumed that the market price is given so that neither the sellers nor the buyers can affect the price.

II) Cardinal measurement of utility

III) Diminishing Marginal utility :– Excess of utiliity tends to decline when the the consumer buys more of a commodity. The last unit purchased by the consumer at equilibrium point has zero consumer's surplus.

IV) Constant Marginal utility of money

V) No close substitute of the commodity is available.

VI) Utility of each commodity is absolute and is independent of other goods and services consumed by the consumer.

Explanation :–

Consumer's surplus = Price prepared to pay – Actual price paid

OR

C.S. = T.U. – (Px Q)

here, T.U. = Total Utility, P = Price, Q = Quantity

The measurement of consumer's surplus

Units of Commodity	Marginal Utility of X (MUX)	Market Price Px	C.S. Paise
1	35	10	25
2	30	10	10
3	22	10	12
4	10	10	0
Total :– 4 units	T.U. 97	40	57

Thus,C.S. = T.U. – (PxQ)

= 97 – (10x4)

= 97 – 40 = 57

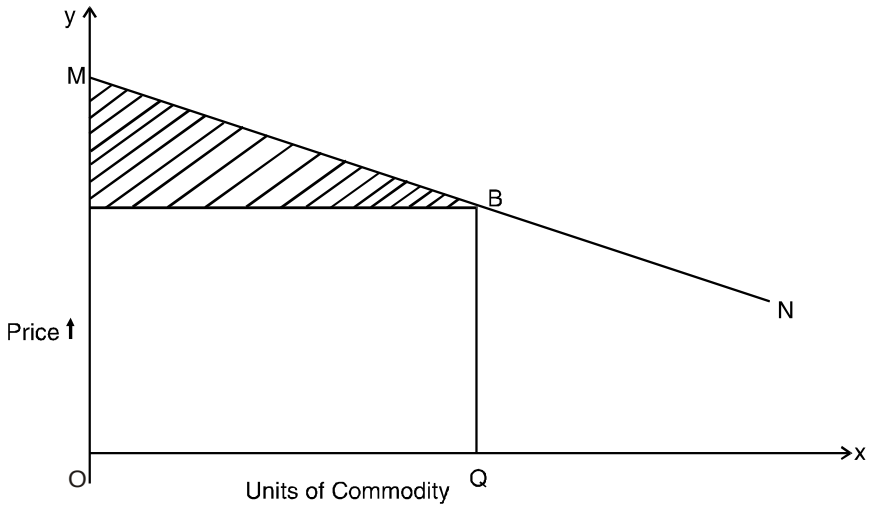


Fig. No. 8.1

The consumer's willingness to pay has been shown by his demand curve MN. The market price i.e., the price the consumer actually pays is

given as OP. At price OP, the consumer buys OQ units. The total utility is OMBQ for which the consumer's surplus is area OMBQ – area OPBQ = area PMB, the shaded area in the diagram.

7.1.3 CRITICISM :

I) **Unrealistic assumptions :–** Marshall's consumer surplus is based on unrealistic assumption of cardinal meausrement of utility, constant Marginal utility of money, no substitute available etc.

II) **Measurement impossible :–** The measurement of CS is based on guess work that a consumer would be willing to pay maximum price for a commodity rather than go without it against the prevailing market price. It is difficult to say whether they do this in real life.

III) **Meaninglessness of the concept in certain cases :–** It is meaningless to apply it in case of necessities like water. A consumer derives infinite utility and would be willing to pay any thing for it. So, it is meaningless to say that every time a consumer drinks a glass of water, he enjoys immense C.S.

IV) **Impractical Concept :–** Critics like Fittle feel that the concept of C.S. has no practical utility. Acc. to him, it is a useless theoretical toy having no practical significance.

V) **No empirical test :–** It is purely a subjective phenomenon, not capable of empirical testing.

VI) **Neglects the income effect of the price change :–** Hicks has criticised Marshall's measure of C.S. on the ground that it neglects the income effect of the change in price along the demand curve from which the triangle of consumer's surplus is formed.

VII) **Not applicable to highly superior and Giffen goods :–** Marshall's C.S. is not applicable to goods of distinction such as jewellery and diamonds as well as inferior goods.

7.1.4. IMPORTANCE :

I) **It clarifies the Paradox of Value :–** The consumer's surplus is useful in clarifying the paradox of value by showing the distinction between value - in -use and value- in - exchange. Water has immense value in use but little value-in exchange despite its high usefulness. In articles like salt, matchboxes, oil etc. which are necessities of daily consumption, the C.S. is high, while commodities like diamond and other luxuries have less value - in - use as compared to their value is exchange, hence, their C.S. is less.

II) **Conjunctural Advantage :–** The concept of C.S. does emphasise the amenities that we enjoy in a modern economic society. Much of the C.S. we enjoy depends on our surroundings and the opportunities of consumption available to us. The concept enables us to compare the advantages of environment, and opportunities on conjuncture benefits. The larger the C.S., the better off are the people. The concept, thus, serves as an index of economic betterment.

III) **Importance to the Monopolist :–** The monopolist can put a higher price on the goods if the C.S. is high, without causing any reduction in sales.

IV) **Importance in Taxation Policy :–** It is of great importance to the exhequer in determining indirect taxation. The Finance Minister can easily levy more taxes where C.S. is high.

V) **Importance in welfare economics :–** By estimating the difference in C.S. resulting from a change in price, we can know and compare the effects of a given change in the price of any commodity on the different classes of people. It is therefore, widely adopted in Welfare Economics.

VI) **Importance in International Trade :–** Gains from international trade can be measured in terms of C.S. obtained from the imported goods.

CONCLUSIONS :

Though the concept of C.S. has certain drawbacks, it is not totally illusory. It is not just a theoritcal toy without any practical significance. In fact, C.S. is a common experience of all the consumers in a market economy. Thus, Prof. D.H.

Robertson is correct when he says that provided we do not expect too much from it, the concept of C.S. is both intellectually respectable and useful as a guide to practical action in many fields.

SELF ASSESSMENT EXERCISE :

Q. 1 Define consumer's surplus.

Q. 2 What is consumer's surplus? How would you measure it?

Q. 3 Examine critically the Marshallian concept of consumer's surplus.

Q. 4 What are the assumptions underlying the Marshallian concept of consumer's surplus? Trace the importance of the concept of consumer's surplus.

FURTHER READINGS :

Economic Theory Micro Analysis by D.M. Methani

Modern Economic Theory by K.K. Dewett

Micro Economics by D.N. Dwivedi

Modern Micro economics by H.L. Ahuja.

EC 101

Semester - I **LESSON No. 8**

PRODUCTION DECISIONS; PRODUCTION FUNCTION; ISO-QUANT

Objectives :

After going through this lesson, you should be able to :

1. Describe the technological relationship between inputs and outputs in physical terms;
2. Analyse the marginal input-output relationships under :
   (a) Short run and
   (b) Long run conditions;
3. Locus of all technically efficient methods of production for producing a given level of ouput;
4. Understand the philosophy of marginal rate of technical substitution between factors and;
5. Work out least cost combination of factors of production.

Structure :

8.0 Iso-quant

8.1 Concept

8.2 Properties of Iso-quants

8.0 PRODUCTION DECISIONS :

8.1 PRODUCTION FUNCTIONS :

A production function is a purely technical relation which connects factor inputs and outputs. Production Function refers to the functional relationship between inputs and output of a firm over a given period of time under the given technology. It includes all the technically efficient methods.

8.2 METHOD OF PRODUCTION :

A method of production is a combination of factor inputs required for the production of one unit of output. A commodity may be produced by various methods of production. For example, a unit of commodity X may be produced by the following processes as shown in Fig. No. I.

	Process P1	Process P2	Process P3
Labour units	2	3	4
Capital "	3	2	1

These three processes are shown in this figure.

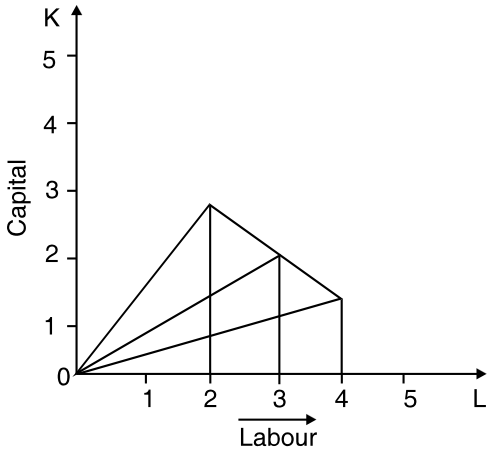


Fig. No. 1

	A	B
Labour	2	3
Capital	3	3

Let us suppose commodity y can be produced by two methods A and B. Method A is technically more efficient relative to other method B, as A uses less of one factor and no more of other factor as compared to B. Method B is technically less efficient.

Production function involves concepts which are useful tools in all fields of Economics. The main concepts are :–

1. The marginal productivity of the factors of production
2. The marginal rate of substitution and the elasticity of substitution.
3. Factor intensity
4. The efficiency of production
5. The returns to scale.

The general mathematical form of the production function is :–

$Y = f(L,K,R,S,V,Y)$

Y	= output	L	=	labour input
K	= Capital input	R	=	Raw material
S	= Sand input	V	=	Returns to scale
Y	= efficiency parameter.			

Graphically, the production function is usually presented as a curve on two dimensionsal graphs. Changes in related variables are shown either by movements along the curve that depicts the production function or by shifts of this curve as shown in diagram no. 2 and 3. In fig. No. 2, each curve shows the relation betweeen X and L for given K, V and Y. As labour increases, ceteris paribus, output increases: we move along the curve depicting the production Function. If capital increases, the production Function X= F(L) shift upwards.

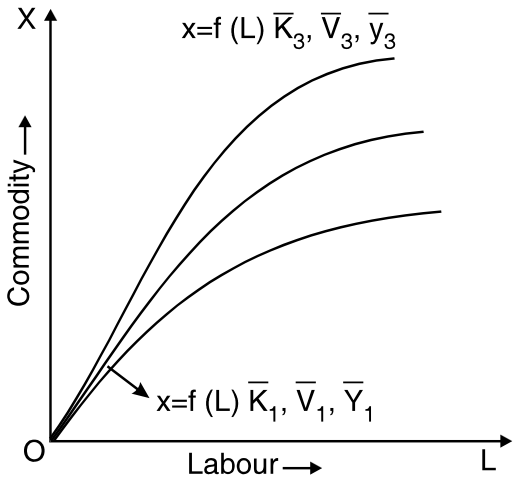


Fig. No. 2

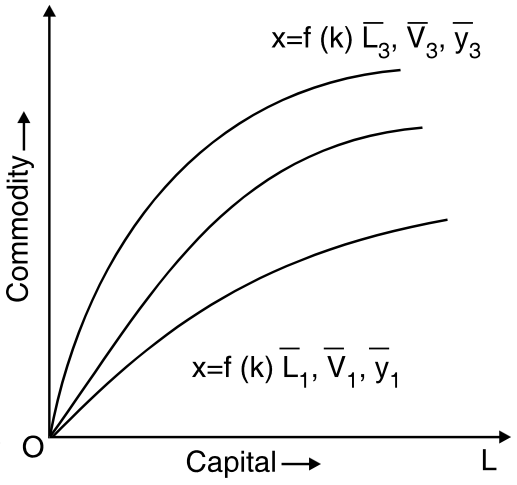


Fig. No. 3

In Fig. No 3, each curve shows the relation between X and K for given L, V and Y. As capital increases, cateris paribus, output increases, we move along the curve. If L increases the prod function X = f (K) shifts upwards.

8.3 SHORT RUN PRODUCTION FUNCTION :

By definition in the short run, the prod. Function includes fixed and variable components of inputs. At least one significant factor is fixed over the short preiod. Algebraically, it is stated as

Y = f (L/Ko, Ro, So, Vo -------- Yo T).

Where stroke (/) divides between variable and fixed components. Subscript O at the top is used to denote fixed factor. Thus, L is variable factor K.,R,S,V, Y etc. are fixed factors. Technology T is held constant.

8.4 LONG RUN PRODUCTION FUNCTION :

In the long run, the firm operates with the changing scale of output and its size as a whole is varied. Thus long run production function is

Y = f(L,K, R,S,V, Y ----- T).

In the long run, all factors are variable factors. However, I, the state of technology, is held constant.

8.5 COBB DOUGLAS PROD. FUNCTION :

C.P Cobb and P.H. Douglas made a statistical inquiry into some manufacturing industries in America and other countries to trace the empirical relations between changes in physical inputs and the resulting output. From their studies, a generalised form of production function with two variable inputs viz labour and capital has been evolved which is as follows :–

$$X = bo\ L\ bi\ Kb2$$

Where X is the quantity of output, L and K stand for the quantities of labour and capital, while b1 and b2 are the positive constants.

The above stated Prod. Function is a linear and homogeneous function of degree one which establishes constant returns to the scale. The returns to scale are measured by the sum (b1 +b2) = r

ISOQUANT

Concept : An isoquant is the locus of all the technically efficient methods of production for producing a given level of output. It is also known as equal product curve which means contour lines which trace the loci of equal outputs. The other names are iso-product curves and production indifference curves.

Table 1

Various factor combinations to produce a given level of output

Factor combination	Factor X	Factory Y
A	1	14
B	2	10
C	3	7
D	4	5
E	5	4

Each of the factor combinations A, B, C, D and E gives the same level of output say 100 units.

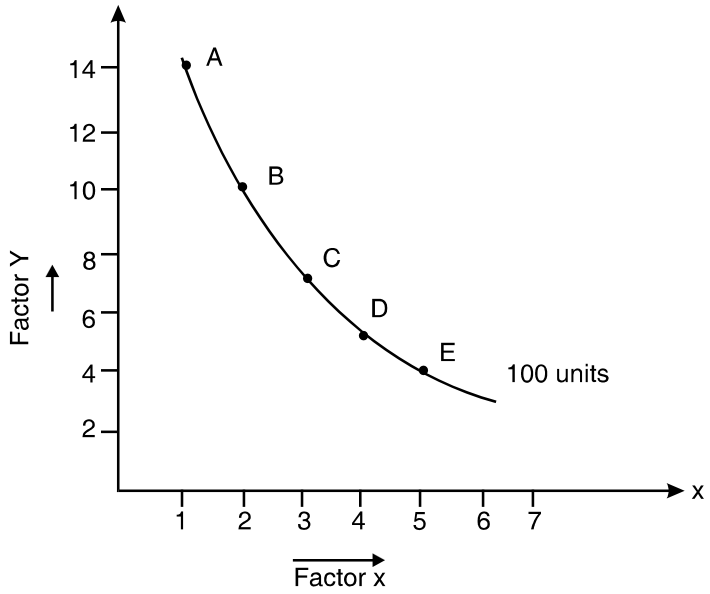


Fig. 4

Combination A consists of 1 unit of factor X and 14 units of factor Y producing 100 units of output and so on as in Fig. No. 4.

Isoquant Map : A family of isoquants in a single diagram is known as isoquant map. For example in Fig No. 5, four isoquats are drawn representing 100 units, 200 units, 300 units and 400 units of output.

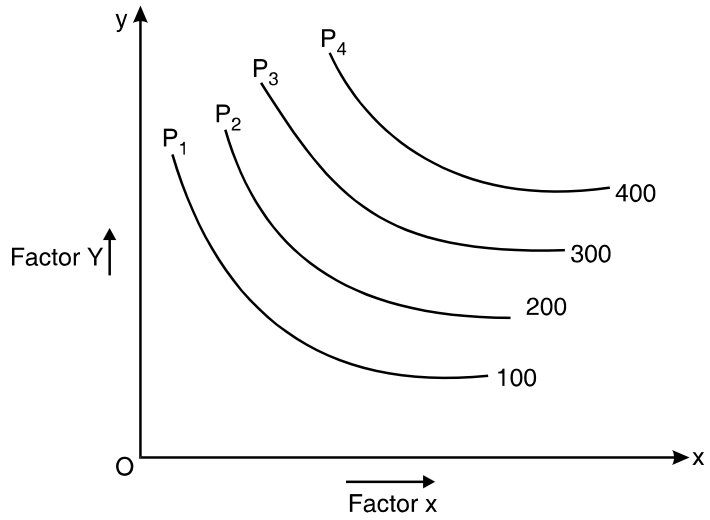


Fig. 5

Marginal rate of technical substitution : MRTS of factor X for factor Y may be defined as the amount of factor Y which can be replaced by one unit of factor X, the level of output remaining unchanged.

Table 2

Marginal rate of technical substitution

Factor Combination	Factor X	Factor Y	MRTS x Y
A	1	14	4
B	2	10	3
C	3	7	2
D	4	5	2
E	5	4	1

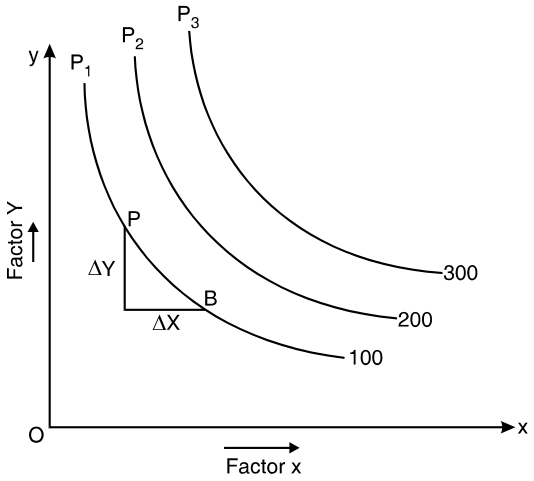


Fig No. 6

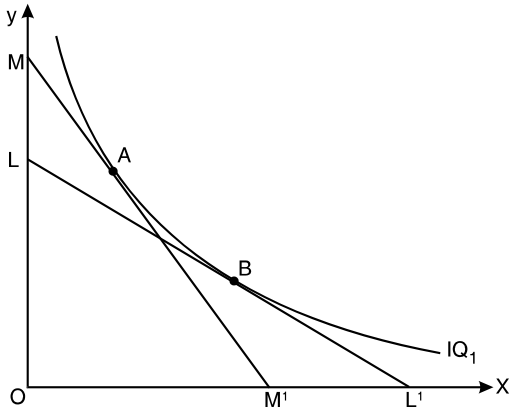


Fig No. 7

The MRTS at a point on the isoquant can be known from the slope of the isoquant at that point. Consider a small movement on the IQ (100 units) from A to B in Fig. 6 where a small amount of factor Y is replaced by an amount of X without any change in output. The loss of output due to falling Y has been compensated by gain in output due to additional units of X. The slope of isoquant is :-

$$MRTS_{L,K} = \frac{MP_L}{MP_K}$$

So MRTS is equal to the ratio of the marginal products of the two factors

By definition, output remains constant on the isoquant. The loss is equal to the marginal product of factor Y multiplied by the amount of reduction in Y. Similarly the gain of output is equal to the marginal product of factor X multiplied by the increase in the amount of X.

The MRTS of X for Y is diminishing. The reason is that as the quantity of factor X is increased and the quantity of factor Y is reduced, the marginal productivity of X diminishes and of Y increases. Therefore, less and less of factor Y is required to be replaced by an additional unit of X so as to maintain the same level of output.

Properties : The isoquants are negative sloped: They slope downward from left to right. This is because when the quantity of factor X is increased, the quantity of factor must be reduced so as to keep output constant as in Fig. No. 8.

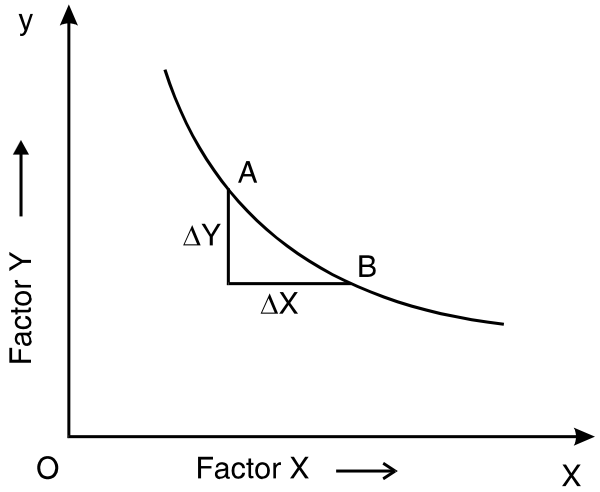


Fig. 8

2. Isoquants are convex to the origin: Isoquant has a convex shape. As we move down on the curve, less and less of factor Y is required to be

substituted by a given increase in factor X so as to keep the output level constant. The convexity of isoquant is owing to the diminishing MRTS as in Fig, No, 9.

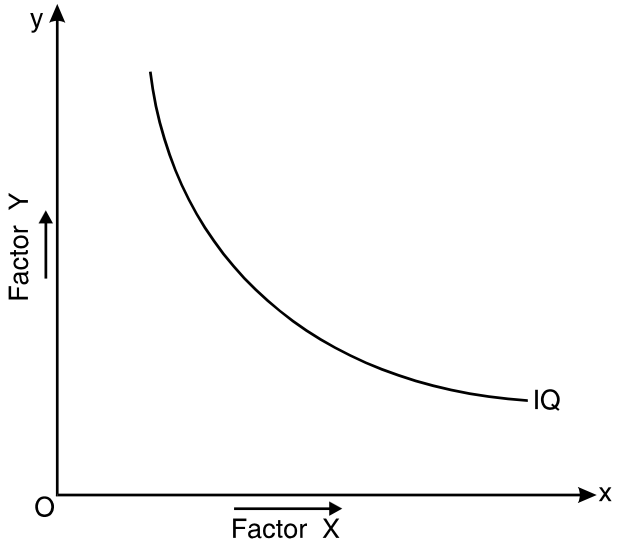


Fig 9

3. Isoquants cannot intersect each other : If two isoquants intersect each other, it would lead to an absurd result. For example in the fig. IQ_1, is showing 100 units and IQ2 is showing 200 units intersecting each other at point C. Since an isoquant represents those factor combinations which yield same output, the combinations A and C will give equal output namely 200 units as they are on IQ2 . On the similar lines, combination B and C give same output 0f 100 units. If combination A is equal to combination C in terms of output, then combination A should gives same output. This is clearly absurd as how can the same factor combination yield two different outputs, under constant technological conditions as in Fig No. 10.]

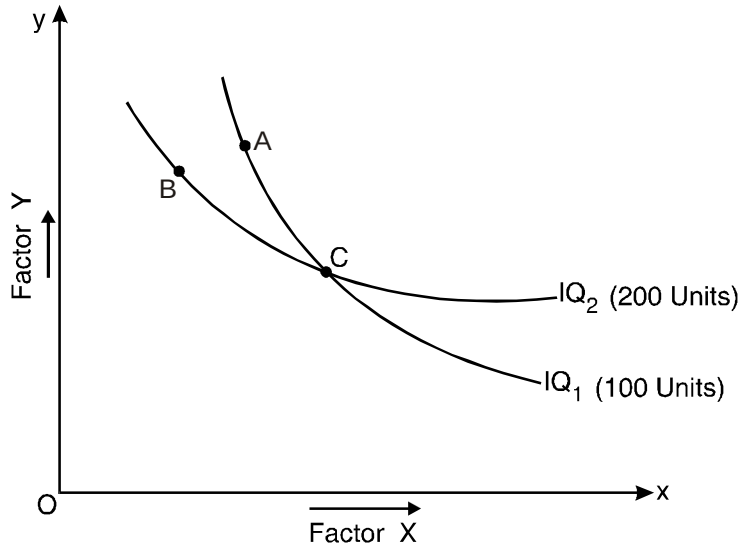


Fig. 10

4. Further away from origin an isoquant lies, higher the level of output it shows :– Let us compare point A in IQ_1, with point B in IQ2 in fig No. 11. The firm is using more of factors X and Y at point B in IQ2 with more of both inputs; we should expect to produce more output. Thus as the firm moves from a lower isoquant to a higher one, it is moving to larger quantities of output.

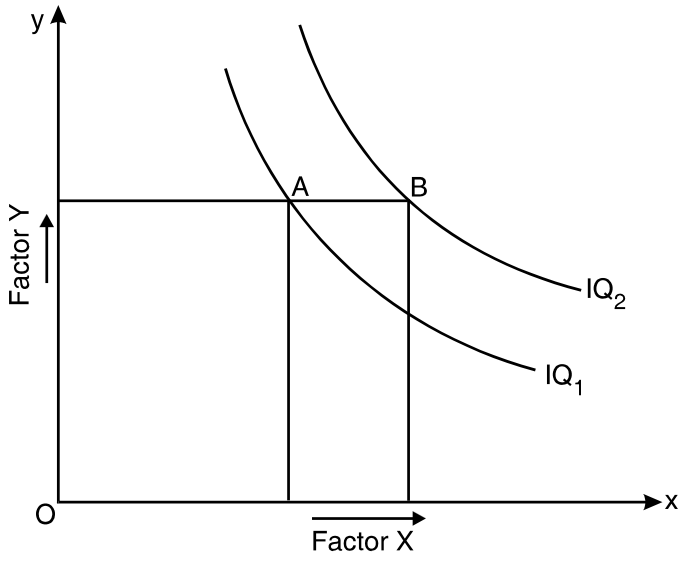


Fig. 9.11

5. Isoquants may not be parallel to each other: Isoquants may be parallel or may not be parallel to each other because the rate of substitution between two factors is not necessarily the same in all the isoquant schedules as in Fig,. No. 11.

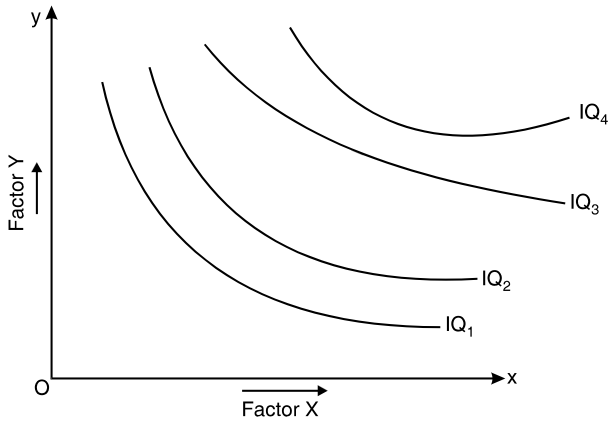


Fig 9.11

6. An isoquant does not touch the horizontal or the vertical axis:- If an isoquant touches X axis, it would mean that the product is being produced with the help of labour alone without using capital at all. This is logically wrong, as OL units of labour alone are incapable of producing anything. Similarly OC units of capital alone cannot produce anything without the use of labour as in Fig No. 12.

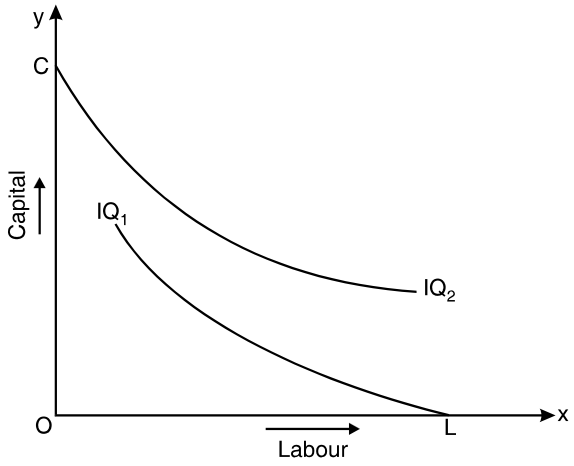


Fig 9.12

TEST YOUR KNOWLEDGE

Q 1. What is a production function? How does a production function serve a useful purpose in production analysis?

Q 2. What is meant by linear homogenous production function? What are its important properties?

Q 3. What is a linear production function? What kind of returns to scale is indicated by a linear homogenous production function?

Q 5. What are iso-quants? Why does an iso-quant slope downward? Why cannot iso-quants cut each other? Why are they convex to the origin?

Q 6. What is meant by marginal rate of technical substitution between factors (MRTS)? Why does marginal rate of technical substitution of labour for capital diminishes as more labour is used by substituting capital?

FURTHER READINGS :

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EC 101

Semester - I **LESSON No. 9**

EQUILIBRIUM OF THE FIRM AND EXPANSION PATH

Objectives :

After going through this lesson, you will be able to understand that how a producer works out the least cost combination of factors to maximise the profits. You should also know that how an entrepreneur will change his factor combination as he expands his output, given the factor prices.

Structure :

9.0 Equilibrium of the firm

9.1 Introduction

9.2 Equilibrium of the firm - Marginal Revenue and Marginal cost Approach.

9.3 Producer's Equilibrium - Least cost combination of factors approach

9.3.1Expansion Path.

9.0 EQUILIBRIUM OF THE FIRM

9.1 INTRODUCTION :

Firm is said to be is equilibrium when it has no tendency either to increase or to contract his output. Since we assume that the firm aims at maximizing its profits, it will therefore be in equilibrium when it is making maximum money profits. The firm will produce the equilibrium level of output and will charge the price at which the equilibrium output can be sold in the market.

9.2 EQUILIBRIUM OF THE FIRM :

Marginal Revenue and Marginal cost Approach :– Marginal Revenue means the addition made to the total revenue by producing and selling an additional unit of output; and marginal cost means the addition made to the total cost by producing an additional unit of output. A firm will go on expanding its level of output so long as an extra unit of output adds more to revenue than to cost, since it will be profitable to do so. It will not be profitable for the firm to produce a unit of output of which MC is greater than MR.

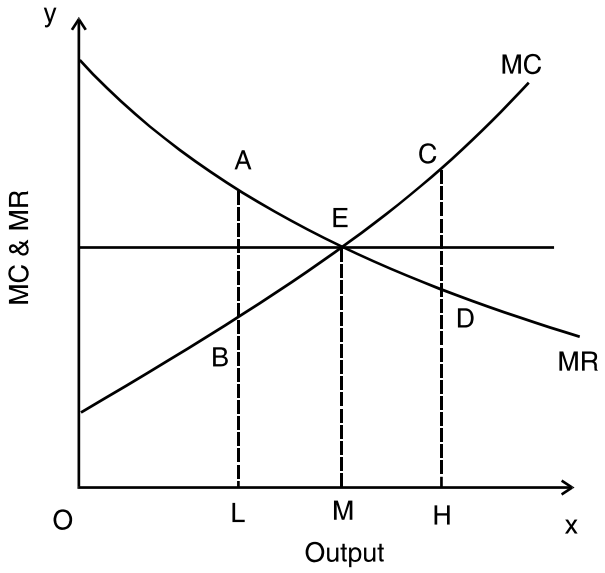

Fig. 1

In the Fig. above, firm's MR curve is sloping downwards and Firm's MC curve is sloping upward and they intersect each other at point E which corresponds to output OM. Upto OM level of output, MR exceeds MC and at OM the two are just equal to each other. The firm will be maximising its profits by producing OM output. The total profits will be less if it produces less than or more than OM i.e. if the firm produces OL level of output, it will be foregoing the opportunity to earn more profits which it can if it raises output to OM. The extra units between L and M can, give to the firm extra profits equal to the area ABE. Extra units

beyond OM add more to cost than to revenue and therefore, the firm will be incurring a loss. On the units M to H, the firm will be incurring a loss equal to the area CDE.

Thus, the condition of the equilibrium of the firm is that the MR should be equal to MC.

9.3 PRODUCER'S EQUILIBRIUM OR LEAST COST (OPTIMUM) COMBINATION OF FACTORS :

Producer's equilibrium can be analysed exactly on the same lines as consumer's equilibrium. Producer wants to get the maximum possible output from the given outlay on the employment of factors of production or he intends producing a given output at least cost. Therefore, isoquant map is helpful in finding out producer's equilibrium.

Let us suppose that the entrepreneur has decided about the level of output to be produced. To produce a given level of output, he will choose that combination of factors which minimizes his cost of production with least - cost combination of factors as it will be optimum for him.

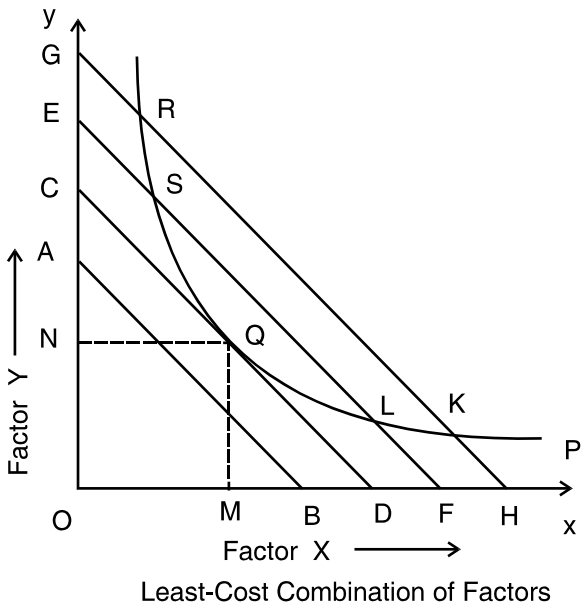

Fig. 2

Suppose the entrepreneur has decided to produce 500 units of output which is represented by the equal product curve P. It can be produced by any factor combination such as R,S, Q,L,K etc lying on the equal product curve P. But the cost will be minimum at point Q at which the Iso cost line CD is tangent to the given equal product curve P. Factor combination Q is an optimum combination for him and he will choose Q, that is, OM units of factor X and ON units of factor Y to produce 500 units of output.

At the point Q, since the slope of the isoquant P is equal to the slope of the iso cost line, the MRTS of the two inputs X and Y equals their price ratio. The following condition is being fulfilled.

$$\text{MRTS (of factor X, for factor Y)} = \frac{\text{Price of factor X}}{\text{Price of factor Y}}$$

The marginal rate of technical substitution of X for Y is equal to the ratio of the marginal physical products of the two factors.

Therefore,

$$MRTSxy = \frac{MPx}{MP\ y} = \frac{Px}{Py}$$

Or $$\frac{MPx}{MP\ y} = \frac{Px}{Py}$$

Or $$\frac{MPx}{Px} = \frac{MPy}{Py}$$

The MRTS is given by the slope of the equal product at its various points and the price ratio of the factor is given by the slope of the iso cost line. The entrepreneur will not choose to produce the given output at point R and S, because on these points, MRTSxy is greater than the price ratio. Similarly he will not choose to produce the given output at point L and K, because on these points MRTSxy is smaller than the price ratios.

The entrepreneur will be in equilibrium with regard to his uses and

purchase of the two factors, when he is using such quantities of the two factors that the marginal physical products of the two factors are proportional to the factor prices. If, for instance, the price of factor X is twice as much as that of factor Y, then the entrepreneur will purchase and use such quantities of the two factors that the Marginal Physical product of factor X is twice the marginal physical product of factor Y.

9.3.1 EXPANSION PATH

We explained above about which factor combination a firm will choose to produce a specified level of output, given the prices of the two factors. We will now study how the entrepreneur will change his factor combinations as he expands his output, gives the factor prices.

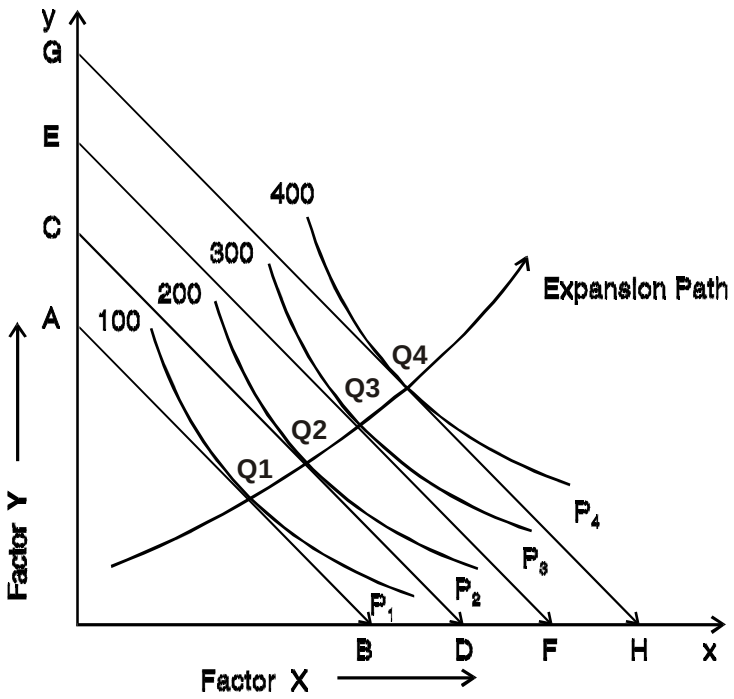

Fig. 10.3

Iso-cost lines AB, CD, EF, GH are drawn which show different levels of total cost of outlay. All are parallel to each other indicating that prices of the two factors remain the same. If the firm wants to produce a level of output

as denoted by P1, then it will choose the factor combination Q1 which minimizes cost of production, Q1 being the point of tangency between the equal product curve P1 and the Iso cost line AB. Now if a firm wants to produce a higher level of output as denoted by the equal product curve P2, it will then choose the factor combination Q2 which is the least cost combination for new output.

Likewise, for still higher output levels as denoted by P3 and P4, the firm will respectively choose tangency combinations Q3 and Q4 which minimize costs for the given outputs.

The line joining the minimum cost combinations such as Q1, Q2, Q3, Q4 is called the expansion path because it shows how the factor combinations, with which the firm produces, will alter as the firm expands its level or output. It is also known as scale line because it shows how the entrepreneur will change the quantities of the two factors when he increases the scale of production. When the production function exhibits constants returns to scale, the expansion path will be a straight line through the origin.

When both factors are variable and the prices of factors are given a rational producer will seek to produce at one point or the other on the expansion path.

Test Your Knowledge

Q. 1 What is meant by optimum factor combination in production? Explain with the help of isoquants and isocost lines how a producer achieves this combination of factors.

Q. 2 Show with the help of isoquants that a firm will be in equilibrium regarding use of a factor combination, when marginal rate of technical substitution between factors is equal to the ratio of factor prices.

Q. 3 State the conditions under which a firm can minimise the cost for a given level of production.

Q. 4 What are the conditions for least cost combination of inputs? Show the maximisation of output with the help of isocosts and isoquants at a given total cost.

Q. 5 What is a firm's expansion path? Under what conditions would it be a straight line ?

Q. 6 What is an expansion path? Show that expansion path of a linear homogenous production function is a straight line through the origin.

Q. 7 Write a detailed note on firm's expansion path.

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1. Dwivedi, D.N : *Micro Economics*, Pearson Education, New Delhi.
2. Ahuja, H.L. : *Modern Micro Economics*, S.Chand, New Delhi.
3. Chopra, P.N. : *Principles of Economics*; Kalyani, New Delhi.
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Semester - I **LESSON No. 10**

EC 101

LAW OF VARIABLE PROPORTIONS

Objective :

After going through this lesson, you should be able to understand that the variations in the ratio of the factor inputs cause a change in the size of production at various rates, i.e., the continuous change in proportion of the factors of production changes the production first at increasing rate, then at constant rate, and finally the change takes place at diminishing rate.

Structure :

10.0 THE LAW OF VARIABLE PROPORTIONS

10.1 INTRODUCTION :

The Law of variable proportions is one of the fundamental laws of Economics. Physiocrats were the first to discover the working of the laws of

returns and associated the law of increasing returns with agriculture. The classical economists like Adam Smith, David Ricardo and Malthus associated the law of diminishing returns with agriculture. But modern economists are of the opinion that there is only one law of production and that is 'Law of variable proportions". Modern economists suggest that the law of diminishing returns is not a separate law of production but is only the second phase of the universal law of variable proportions.

10.2 MEANING :

The law deals with the short run. In the short run, factors of production are of two types-(a) fixed factors (b) variable factors. In the short run, the size of prod. can be changed by altering the variable factors of prod. only. The variation in the ratio of the factor inputs causes a change in the size of production at various rates. This tendency of change in the production is termed 'the law of variable proportions'. The law shows that continuous change in proportion of the factors of prod. changes the production first at increasing rate, then at constant rate and finally change takes place at diminishing rate.

The law of variable proportions may be stated as follows, "if we keep the quantity of one or more factors of prod. constant and gradually increase the quantities of other variable factors, then after a point, the corresponding return of every additional unit of the variable factor will begin to diminish."

Assumptions :–

Constant Technology : The law of variable proportions assumes the techniques of production as constant.

Short-run : The law operates in the short-run because here some factors are fixed and proportions of others have to be varied.

Homogeneous factors : The law is based on the assumption that each factor unit is homogeneous or identical in amount and quality.

The law supposes the possibility of the ratio of fixed factors to variable factors being changed.

Explanation of the law : The law can be explained with the help of a table:–

Table I

A Prod. Function with one variable input showing the three stages of the law of variable proportions.

Units of labour	Total Product	Average Product	Marginal Product	
1.	20	20	20	Ist
2.	70	35	50	stage
3.	110	36.6	40	
4.	140	35	30	2nd
5.	160	32	20	stage
6.	160	26.6	0	
7.	150	21.4	-10	3rd
8.	130	16.2	-20	stage

Diagrammatic Representation :

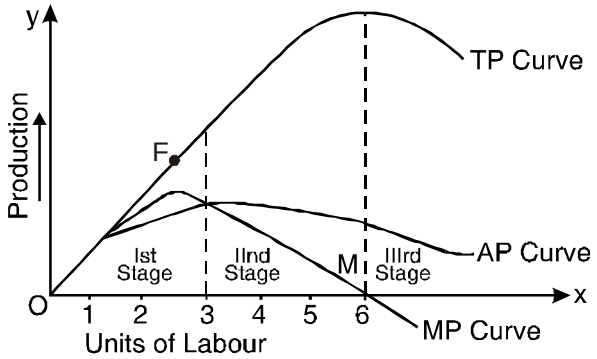

Fig No. 1

Three phases of the law :– The three stages of law of variable proportions are easily identified in the diagram no. 1.

Ist Phase : The stage of increasing returns: In this stage, total product upto a point increases at an increasing rate. From the origin to the point F, slope of the T.P curve is increasing at a increasing rate which means that the MP rises. From the point F onwards during the stage I, the total product increases at the diminishing rate which means M.P. falls but is positive. The point F is called the point of inflexion . The stage I ends where the A.P. curve reaches its highest point.

Explanation of increasing returns :–

Abundant Fixed Factor :– In the beginning, the quantity of the fixed factor is abundant relative to the quantity of the variable factor. Therefore, when more and more of variable factor are added, the efficiency of the fixed factor increases.

Specialization or division of labour :– The second reason is that as more units of the variable factor are employed, it becomes possible to introduce specialization or division of labour which results in higher productivity.

10.6 IInd PHASE :

Stage of Diminishing returns :– In this stage, the total product continues to increase at a diminishing rate until it reaches its maximum point and where the IInd stage ends. In this stage, both the marginal product, and the average product of the variable factor are diminishing but are positive. At point M, at the end of this stage, Marginal product is zero.

Explanation of diminishing returns :

(i) Fixed factor becomes scarce :– In this stage, the fixed factor becomes more and more scarce in relation to the variable factor, so that as the units of the variable factor are increased, they receive less and less aid from the fixed factor. As a result, the A.P. and M.P. of the variable factor decline.

IIIrd phase :– The stage of negative returns:- In this stage, total product declines and therefore, T.P. curve slopes downward. As a result, M.P. of the variable factor is negative and M.P. curve goes below X axis.

Explanation of the negative returns :

(i) Abundant Variable factor :– In this stage, variable factor is too much in relation to fixed factor. So they get in each other's way. With this, the total output falls instead of rising. Here the M.P. of the variable factor is negative due to its being in excess or beyond the desired level.

(ii) Supervision difficult : - Two much quantity of the variable factor also makes supervision difficult.

The stage of operation :– A rational producer will never choose to produce in stage I where the M.P. of the fixed factor is negative and he will never choose to produce in stage III where M.P. of the variable factor is negative. A rational producer wil always seek to produce in stage II, where both the A.P. and M.P. of the variable factor are diminishing. At which particular point in this stage, the producer will decide to produce, depends upon the prices of factors. The stage II represents the range of rational production decisions.

Limitations :

Indivisible Fixed Factor :– If the fixed factor was finally divisible, neither the increasing returns nor the decreasing returns would have occurred. If the factors were perfectly divisible, then there would not have been the necessity of taking a large quantity of the fixed factor in the beginning. Prof. Bober rightly remarks, " Let divisibility enter through the door, law of variable proportions rushes out through the window".

Imperfect Substitutes :– According to Mrs. Joan Robinson, the diminishing returns occur because factors of production are imperfect substitutes for one another. If they are perfect substitutes, then this law may not occur.

Test Your Knowledge

Q. 1 Discuss critically the law of Variable proportions.

Q. 2 Discuss three stages of the law of variable proportions.

Q. 3 Why is the Law of variable proportions also known as the Law of Diminishing returns ?

Q. 4 Discuss under which stage of the law of variable proportions a rational producer would like to produce?

Q. 5 Discuss the Law of Variable proportions using an appropriate function. Why is this law so called ? Explain with examples.

Q. 6 Show graphical derivation of TP, MP and AP curves. Show also the three stages of production. What economic purpose do the stages of production serve?

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EC 101

Semester - I **LESSON No. 11**

THE LAW OF RETURNS TO SCALE

Objective :

After studying this lesson, you should be able to analyse the rationale, that in the long run, when a firm increases quantities of inputs, other things being equal; the output may rise initially at more rapid rate than the rate of increase in inputs, then output may increase in the same proportion of input and ultimately output increases less than proportionately.

Structure :

11.0 INTRODUCTION :

In the long run, all the factors of production are variable, since producer has enough time to alter them. When all the inputs change proportionately, the

scale of production i.e. the size of the firm changes. The law that pertains to the input- output relationships under the condition of changing scale of production is called the law of Returns to scale.

11.3 MEANING :

"As the firm in the long run increases the quantities of all factors employed other things being equal, the output may rise initially at a more rapid rate than the rate of increase in inputs, then output may increase in the same proportion of input and ultimately output increases less proportionately".

Thus, there are three phases of the law :–

i) Increasing returns to scale

ii) Constant returns to scale

iii) Decreasing returns to scale.

12.4 ASSUMPTIONS :

I) Techniques of production remain unchanged.

II) All units of factors are homogenous.

III) Returns are measured in physical terms.

12.5 INCREASING RETURNS TO SCALE :

When all the factors are increased in a given proportion, output increases by a greater proportion. For example, if the amount of labour and capital is increased by 10%, output increases by more than 10%. If the quantity of labour and capital doubles, output more than doubles as shown in diagram.

In Fig. No. 1, when labour and capital are doubled, output increases from 10 units to 30 units i.e. output more than doubles. Similarly, when the quantity of capital and labour is increased by three times, output goes upto 70 units reflecting increasing returns to scale.

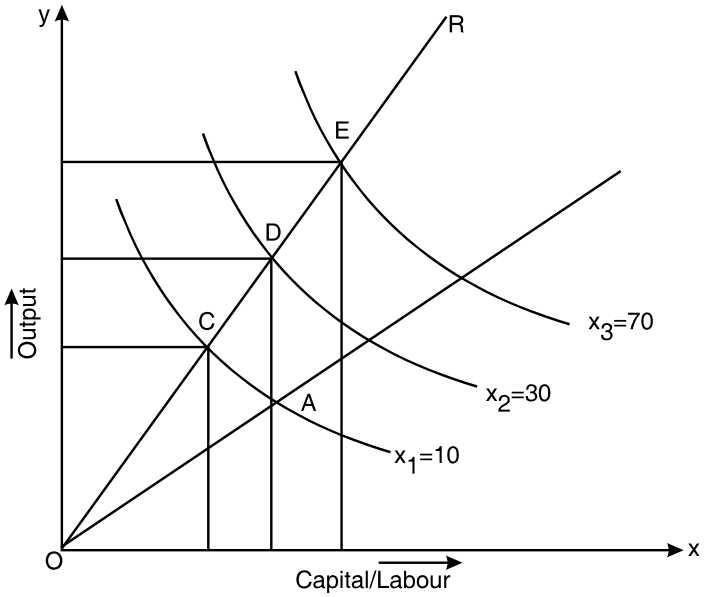

Fig. 1

11.6 Causes of Increasing returns to scale :

i) Specialisation :– Each worker can acquire specialisation in the performance of simple repetitive task rather than many different tasks. Thus, the use of specialised labour and machinery increases productivity per unit of output.

ii) Technical and Managerial Invisibilities :– Certain inputs, mechanical equipment and managerial skills, used in the process of production are available in a given size. Therefore, when scale is increased by increasing all inputs, the productivity increases.

iii) Economies of large scale :– As a firm expands its scale of production, it comes to enjoy certain economies - financial, technical, marketing, and managerial etc.

11.7 CONSTANT RETURNS TO SCALE :

In this case, all factors of production are increased in a given proportion, the output would also increase in the same proportion.

In Fig. No. 2 when the amount of capital K and labour L is double output

increases from 10 units to 20 units. Similarly, when the quantity of capital and labour is increased by three times, output also goes up by three times.

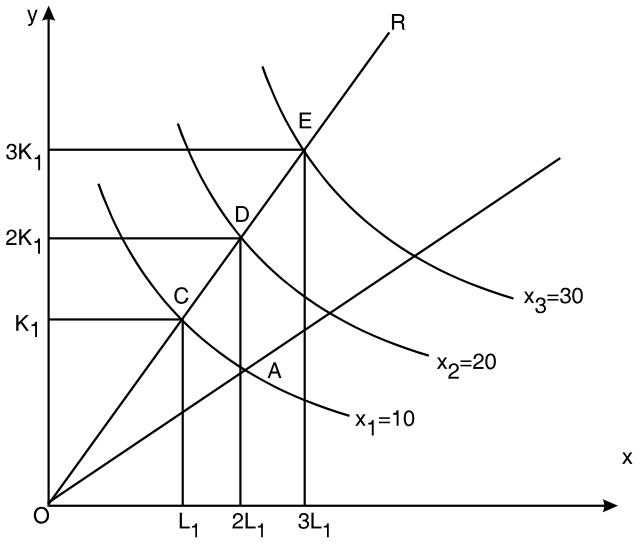

Fig 2

11.8 DECREASING RETURNS TO SCALE :

In case of decreasing returns to scale, output increases in a smaller proportion than the increase in all inputs. If inputs are doubled, output will less than doubled.

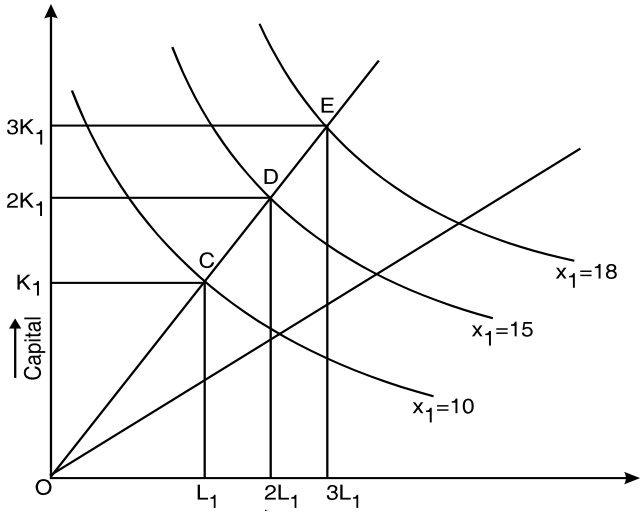

Fig. 3

In Fig. No. 3 we find when use of labour and capital doubles, output increases from 10 units to 15 units. Similarly, when use of labour and capital is increased three times, output goes up from 15 units to 18 units. It mean that as inputs are increased by equal increments, output increases less than proportionately.

11.9 CAUSES OF DECREASING RETURNS TO SCALE :

i) **Diseconomies of large scale production :–** These diseconomies are mainly the result of increasing managerial difficulties.

ii) **Exhaustive Natural Resources :–** Another cause for decreasing returns may be found in the exhaustible natural resources.

iii) **External diseconomies :–** To the diseconomies of management, difficulties of co-ordination and exhaustible natural resources may be added as external diseconomies which also encourage the tendency towards decreasing returns to scale.

TEST YOUR KNOWLEDGE

Q. 1 What is meant by increasing returns to scale? Explain the factors that cause increasing returns to scale.

Q. 2 Explain the laws of returns to scale. Show the three kinds of returns to scale with the help of isoquants. Why do we get decreasing returns to scale?

Q. 3 What are increasing returns to scale? Show them on an isoquant map. Explain the causes of increasing returns to scale.

Q. 4 What is meant by constant returns to scale? Show them with an iso-product map. Is it correct to say that returns to scale would have been constant if the factors of production had been perfectly divisible?

Q. 5 What is meant by decreasing returns to scale? Explain the factors that cause decreasing returns to scale.

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EC 101

Semester - I **LESSON No. 12**

ECONOMIES OF SCALE OF PRODUCTION

Objective :

After going through this lesson, you will be able to visualize a wide range of ways through which the internal and external economies can be realised by the firms.

Structure :

12.0 ECONOMIES OF SCALE OF PRODUCTION :

12.1 INTERNAL ECONOMIES :

Internal economies are those economies which are open to an individual firm when its size expands. They emerge within the firm itself as its scale of production increases. Internal economies in the scale of its output cannot be realised unless the firm increases its output i.e. expands its size. Thus, internal economies are the function of the size of the firm. These are solely enjoyable by the firm itself when its scale of production increases, independently of the actions of other firms.

13.2 EXTERNAL ECONOMIES :

External economies include all those benefits or facilities which accrue to a firm when the size of the industry in which the firm is working increases. External economies are enjoyable by all the firms in the industry, irrespective of their size and scale of production. They are available to all firms from outside. They are the result of the growth and expansion of any particular industry or a group of industries as a whole.

Let us suppose there are seven textile mills in a city, which produce cloth, which is not enough to run a printing plant full time. As a result, these firms are compelled to send cloth to another centre for printing. Now, suppose number of firms rises to twelve. They produce enough cloth to enable a minimum sized plant to work in the city. This is the common facility made open to all firms in the industry.

13.3 FORMS OF INTERNAL ECONOMIES :

i) **Labour Economies :–** Increased division of labour is a major source of labour economies. As output increases and the labour force grows, a more and more complex division of labour with a greater degree of specialization may become possible. Moreover, a large firm can attract more efficient labour as it can offer better prospects of promotion. As such, the skill efficiency and productivity of labour as a whole in such a large firm rises, reducing the cost per unit of output.

ii) **Technical Economies :–** Technical economies refer to reductions in the cost of manufacturing process itself. These relate to the methods and techniques of production. Some types of capital are of big size and are indivisible and can be used only by a large firm. We can classify the various kinds of technical economies as follows :

(a) Economies of superior Technique :– As a firm expands, it can use superior techniques and capital goods. Large firms use automatic machines which are quicker and efficient.

(b) Economies of Increased dimension :– Larger pieces of equipment

are relatively more economical than smaller ones. For example a big ship is more economical than a small one because a big ship can be run by a crew of sailors just as large as required for a small one. Example of wooden box.

(c) Economies of linked process :– A large plant usually enjoys the advantages of the linking of process i.e. by arranging productive activities in a continuous sequence without any loss of time e.g. steel making.

(d) Economies in power :– Large units of machines and their continuous running by a large firm are often more economical in their power consumption as compared to a small machine.

(e) Economies of by products :– A large firm can avoid waste of its raw materials, which it can economically use for manufacturing certain by products e.g. cosmetic firm, by producing washing soap.

(f) Economies of continuation :– Technical economy is also realised due to long run continuation of the process of production e.g printing firm.

(iii) Managerial Economies :– As a result of the indivisibility of managerial factors, the cost per unit of management will fall as output increases. A good manager can organise a large output with the same efficiency as he can organise a small output. Moreover, a large firm can hire a trained specialised manger by paying handsome salary; so his overall administration will be more efficient and economical. A small producer cannot have all such personnel with the knowledge of scientific business administration.

(iv) Marketing Economies :– Marketing economies are economies of buying of raw material and selling goods produced. A large firm can buy more cheaply by purchasing on a large scale and in time. A large firm can employ purchasing experts.

Similarly, selling is generally less expensive per unit when large quantities are distributed. A large firm can employ number of sales experts and undertake wide publicity to stimulate demand. A big firm can also have its own transport vehicles, which are more economical than hired ones.

(v) Financial Economies :– A large firm has a wider reputation and greater influence in the money markets. Big firms are usually regarded less risky by investors. Big firms can easily raise their capital by issuing shares and debentures. A small firm having no recognition cannot borrow money from the general public by offering shares for sale on the stock exchange.

(vi) Risk bearing Economies :– A large firm by producing a wide range of products is in a position to eliminate or minimise business risks by spreading them over in the following ways :–

a) By diversification of output :– As a big firm can produce a number of items and in different varieties, the loss in one can be compensated by gain in other.

b) By diversification of market :– When a product is produced on a large scale, it can have an extended market throughout the country so that danger of fluctuations in demand is reduced to minimum.

c) By diversification of sources of supply as well as of process of manufacturing :– In a large firm, there are less chances of disruption of output as a result of scarcity of raw materials or breakdown of a particular process of manufacturing.

12.4 FORMS OF EXTERNAL ECONOMIES :

i) Physical factors :– As the size of an industry expands, some physical factors may work to reduce the costs of all the firms working in industry. For example, suppose a few firms are working in an area for coal mining. As they mine from underneath the surface of the earth, they have to pump water out of the coal mines which seeps the side of the mines. Now, if the numbers of firms mining coal in the area increases, the costs of pumping out water of each firm shall go down.

ii) Economies of localisation :– When a number of firms are located at one place, all of them derive mutual advantages through the training of skilled labour, provision of better transport facilities, stimulation of improvement etc. Concentration of a particular industry in one area results in the

development of conditions helpful to the industry and all the firms; arrangements can be made for repairs and maintenance and special services required by the industry.

iii) **Economies of information :–** A large and growing industry can bring out trade and technical publications to which every firm can have access. Producers are thus saved from independent research, which is very costly. In a large industry, research work is done jointly and each firm enjoys the benefits of research. Statistical, technical and other market information becomes more readily available to all firms in a growing industry.

iv) **Economies of disintegration :–** As an industry develops, the firms working in it are more agreeable to the splitting of processes of manufacture and handing over each process to different firms. This makes specialisation possible. The separation of different stages of production is of two types :–

a) **Horizontal disintegration :–** This takes place when every firm tries to specialise in one particular item in a line of production rather than producing variety of items e.g. Readymade garments like Saris, Pants, Shirts, suits etc.

b) **Vertical disintegration :–** This is illustrated by the separation of the process of cotton refining, spinning and weaving of cloth.

Both disintegrations reduce costs for the member firms in an industry by reducing duplication, saving time and materials.

v) **Economies of by products :–** A large industry can make use of waste materials for manufacturing by product e.g. leather items produced by a firm.

Test Your Knowledge

Q. 1 Distinguish between internal and external economies of scale. Why can external economies not be internalised ?

Q. 2 Discuss the economies of scale of production. Also explain various forms of internal and external economies.

Q. 3 Following the expansion of an industry in a city, many commercial banks set up their branches in the city. Due to competition among the banks, the rate of interest goes down. As a result, firm's cost of borrowing goes down. Is it an internal or external economy to a firm?

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EC 101

Semester - I **LESSON No. 13**

DIFFERENT CONCEPTS OF COST AND THEIR INTER-RELATIONS

Objectives :

After studying this lesson, you will be able to analyse value of inputs that constitute the total cost of production. You should also be familiar with the various concepts of cost viz., opportunity cost, explicit cost, implicit cost, real cost, social cost etc. Various cost curves and the interrelationship between average and marginal cost are also under the scope of this lesson.

Structure :

INTRODUCTION :

Cost is normally considered from the producer's or firm's point of view. In producing a commodity, a firm has to employ an aggregate of various factors of production. These factors are to be compensated by the firm for their efforts or contributions made in producing a commodity. This compensation is the cost. The value of inputs required in the production of a good determines its cost of output. The term cost has various concepts. These are

I. Opportunity Cost

II. Money Cost

(a) Explicit Cost

(b) Implicit Cost

III. Real Cost

IV. Social Cost

13.1.1 OPPORTUNITY COST :

It is also known as alternative cost. It is a known economic fact that our wants are multiple while our resources are scarce but capable of alternative

uses. We have to choose the use of a given resource for a particular purpose out of its alternative applicability. When we choose the resource in one use, the second alternative use of the resources is to be sacrificed, given the scarcity of resoureces. The sacrifice or loss of alternative use of a given resource is termed as "Opportunity cost".

13.1.2 MONEY COST :

Cost of production measured in terms of money is called the money cost. Money cost is the monetary expenditure in inputs of various kinds of raw materials, wages and salaries paid to labour, the expenditure on machinery and equipment and the needed repairs, the payment for materials, power, light, fuel and transportation, the disbursements of rents, trademarks, advertisements, insurance, taxes etc. Provision for depreciation, obsolescence and bad debts must be made in calculating the cost of the firm.

13.1.3 EXPLICIT AND IMPLICIT COSTS :

While analysing total money cost, the economists speak of explicit and implicit money costs. To determine total costs, they include both explicit as well as implicit money costs.

Explicit costs are direct contractual monetary payments incurred through market transactions.

13.1.3 (a) Explicit Cost :

It refers to the actual money outlay or out of pocket expenditure of the firm to buy or hire the productive resources it needs in the process of production. The following items of a firm's expenditure are explicit money costs.

i) Costs of raw materials;

ii) Wages and salaries

iii) Power charges

iv) Rent of business or factory premises

v) Interest payments of capital invested

vi) Insurance premiums

vii) Taxes like property tax, duties, licence fees, etc.

viii) Miscellaneous business expenses like marketing and advertising expenses, transport cost, etc.

These are recorded expenditures during the process of production. Hence they are included under accounting cost or explicit money costs, as these are actual monetary expenditures incurred by the firm.

13.1.4 (b) Implicit Costs :

Implicit costs are the opportunity cost for the use of factors which a firm does not buy or hire but already owns. Such implicit money costs arise when the firm or entrepreneur supplies certain factors owned by himself i.e. the entrepreneur may have his own land in production, for which no rent is to be paid in the actual sense. Such rent is to be imputed and regarded as implicit cost. This implicit money costs are as follows :

i) Wages of labour rendered by the entrepreneur himself,

ii) Interest on capital supplied by him.

iii) Rent of land and premises belonging to the entrepreneur himself and used in his production.

iv) Normal returns of entrepreneurs, a compensation needed for his management and organisational activity.

Economic Cost = Explicit Cost (Accounting Costs) + Implicit Cost

13.1.4. REAL COST :

The term real cost of production refers to the physical quantities of various factors used in producing a commodity. For example, real cost of producing a table is composed of a carpenter's labour, two cubic feet of wood, a dozen of nails, half a bottle of varnish paint, depreciation of carpenter's tools etc. Real cost, thus signifies the aggregate of real productive resources absorbed in the production of a commodity or a service.

Definition : The real cost of production of a commodity refers to the

exertion of labour, sacrifice involved in the abstinence from present consumption by the savers to supply capital, and social effects of pollution, congestion etc.

13.1.5 SOCIAL COST :

Social cost is the total cost of production of a commodity which includes the direct and the indirect costs which the society has to pay for the output of the commodity. A .C. Pigou has drawn a distinction between private and social costs giving some examples. A mill owner will count his cost of production and never those of the people living around the factory who have to pay more laundry bill due to the soot and smoke coming out of the factory chimneys. In this case social cost is more than private cost.

On the other hand, certain cases can be noticed where private cost is more than the social cost e.g. the building of Bhakhra Nangal system of canals has increased land values phenomenally in the areas of Punjab, Harayana and Rajasthan.

1.2 TWO TYPES OF COST CURVES :

The short run and the long run.

13.2.1 In the short run :

Total Fixed cost :– Total fixed cost corresponds to fixed inputs in the short run production function. It is obtained by summing up the products of quantities of the fixed factors multiplied by their respective unit prices.

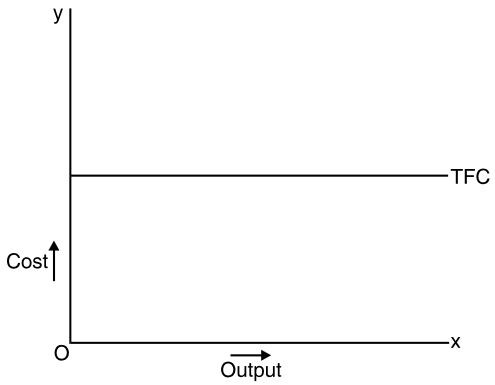


Fig. 1

TFC remains the same at all levels of output in the short run. The TFC is graphically denoted by a straight line parallel to the output axis as in Fig. 1

13.2.2 TOTAL VARIABLE COST :

Corresponding to variable inputs, in the short run production, is the total variable cost. It is obtained by summing up the product of quantities of variable inputs multiplied by their prices.

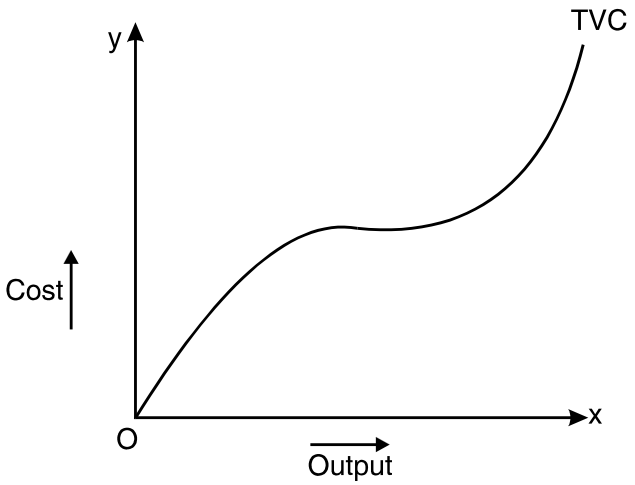


Fig. 2

TVC = f(Q) which means total variable cost is an increasing function of output. The TVC is an inverse S shape which means that at the initial stages of production with a given plant, as more of the variable factor is employed, its productivity increases and the total variable cost falls as in Fig. 2

13.2.3 TOTAL COST :

Total cost is the aggregate of expenditure incurred by the firm in producing a given level of output. Total cost is measured in relation to the production

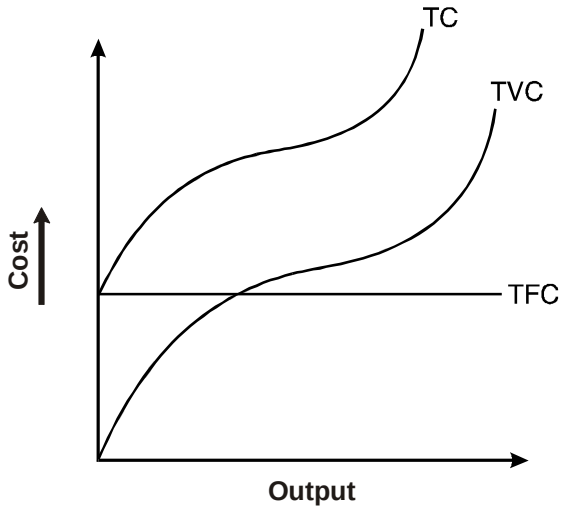


Fig. 3

function by multiplying factor prices with their quantities. If the production function is Q = f(a,b,c,…..n), then total cost is TC = f(q) which means total cost varies with output. Total cost includes all kinds of money costs, explicit as well as implicit. Thus, normal profit is also included in total cost.

In the short run, total cost may be bifurcated into total fixed cost and total variable cost.

$$TC = TFC + TVC$$

13.2.4 AVERAGE FIXED COST :

Average fixed cost is total fixed cost divided by the total units of output. Thus $AFC = \frac{TFC}{Q}$ where Q stands for the number of units of the product. It is a rectangular hyperbola, showing at all its points the same magnitude, that is, the level of TFC. AFC falls with increase in output as in Fig. 4

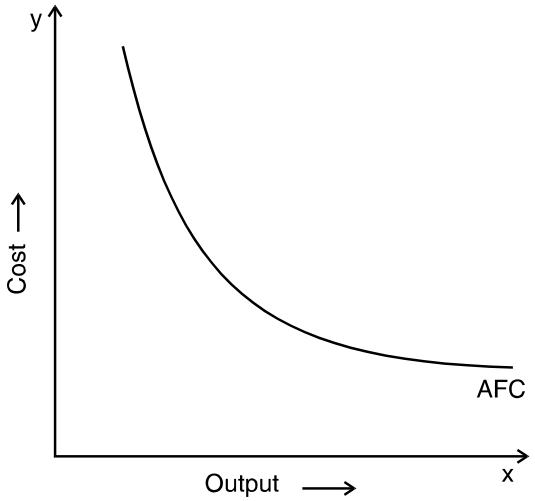


Fig No. 4

13.2.5 AVERAGE VARIABLE COST :

Average variable cost is total variable cost divided by total units of output. Thus AVC = $\frac{TVC}{Q}$ which means variable cost per unit of output. Graphically, it is U shaped which means SAVC curve falls initially as the productivity of the variable factor increases, reaches a minimum when the plant is operated optimally and rises beyond that point as in Fig. 5.

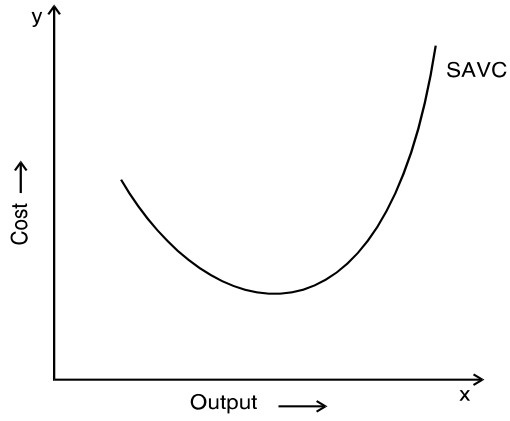


Fig. 5

13.2.6 AVERAGE TOTAL COST :

Average total cost or average cost is total cost divided by total units of output. Thus

$$\text{ATC or AC} = \frac{TC}{Q}$$

In the short run,

$$TC = TFC + TVC$$

Therefore, ATC $= \frac{TC}{Q} = \frac{TFC + TVC}{Q}$

$$= \frac{TFC}{Q} + \frac{TVC}{Q}$$

$$ATC = AFC + AVC$$

Graphically, it is derived in the same way as the SAVC and the shape is similar to that of the SAVC i.e. 'U' shaped as in Fig. 6. However, the U Shape of SAC is different from that of the AVC. The minimum Pt. of AVC takes place to the left of SAC, as for quite a long period of time, SAC keeps falling due to falling AFC. It is only when the falling impact of AFC is less than the rising AVC, that SAC starts rising.

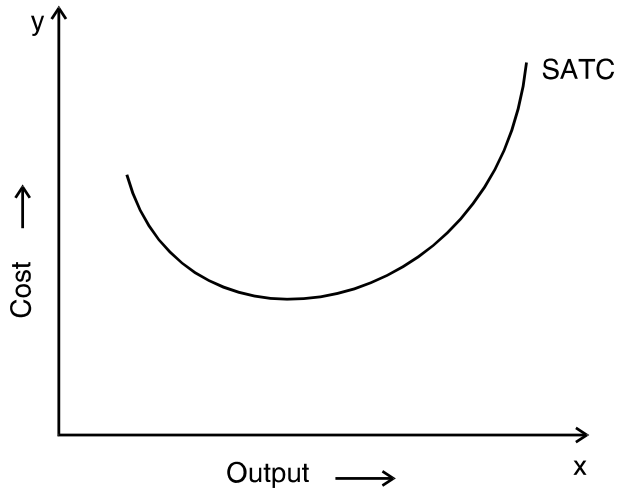


Fig. 6

13.2.7 MARGINAL COST :

It is the addition made to the total cost by producing one more unit of output. MCn = TCn - TC n-1. It is the cost of producing an extra unit of output. It is the first derivative of the TC function. It is the slope of the TC curve and it is also 'U' shaped as in Fig. No,. 7

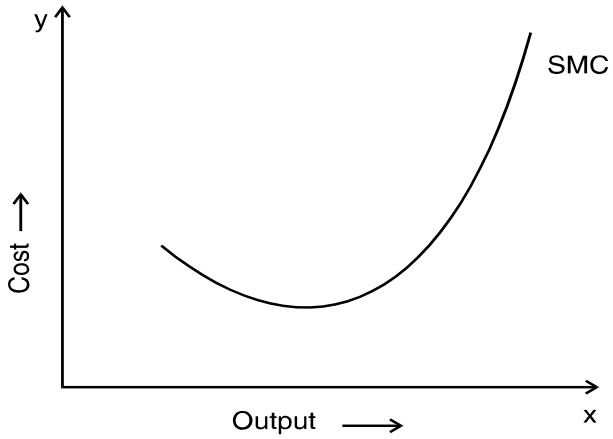


Fig. No. 7

13.3 RELATIONSHIP BETWEEN AVERAGE AND MARGINAL COST :

The relationship between the average and marginal cost curves in shown in the diagram No. 8. The MC curve lies below the average curves to the left of their minimum points and lies above the average curves to the right of their minimum points. It intersects the AC and the AVC curves at their minimum points. The relationship between MC and AC is described in the following points :-

i) When AC falls as a result of increase in output, MC cost is less than average cost.

ii) When AC rises as a result of increase in output, MC is more than average cost.

iii) When AC is minimum, MC is equal to AC.

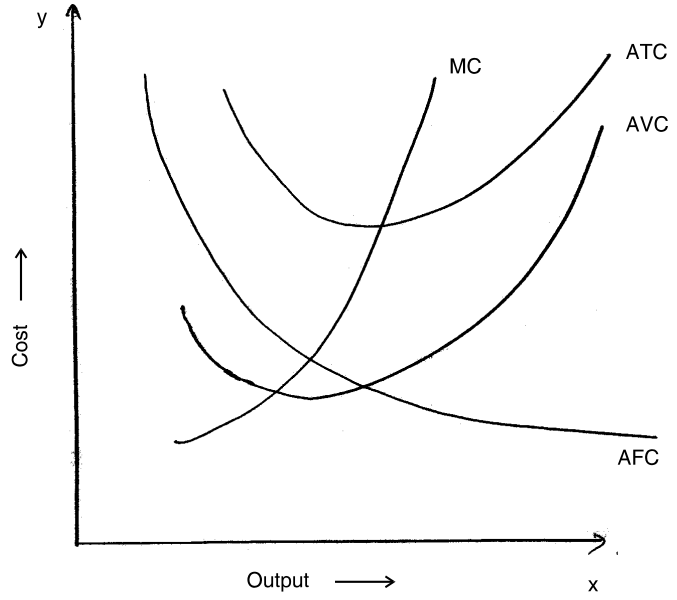


Fig. 8

13.4 LONG RUN COST CURVES :

In the long run, all factors are variable because producer has enough time to change them.

13.4.1 LONG-RUN AVERAGE COST :

The LAC curve is a curve which shows the minimum per unit cost of each quantity of output as in Fig. No. 9.

$$LAC = \frac{LTC}{Q}$$

It is also a 'U' shaped curve. AC is falling if average product is rising and rising if average product is falling as shown in Fig. No. 9. As compared to SAC, LAC is flat U shaped. This is due to the fact that the shape of LAC is determined by the law of returs to scale, whereas that of SAC, by the law of variable proportions. So the three phases of LAC are falling phase, constant phase and rising phase. The falling phase means that the firm is reaping internal economies, The constant phase means that economies have been offset by diseconomies. The rising phase

is due to diseconomics of scale

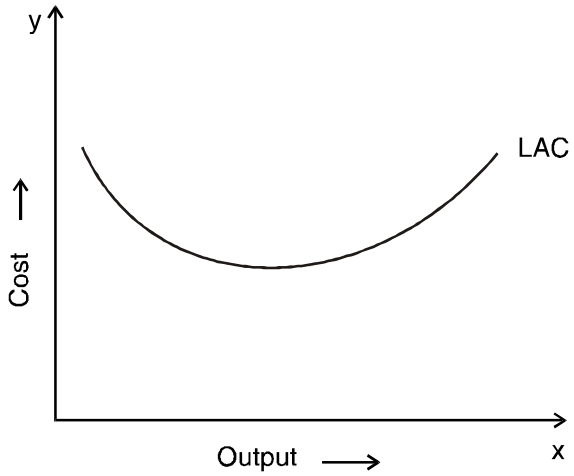
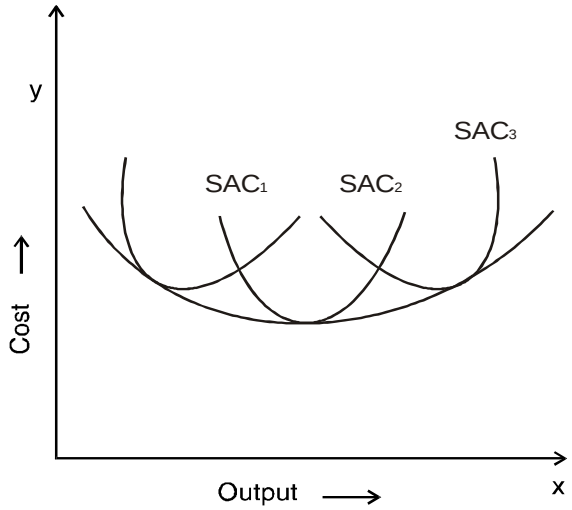


Fig. No. 14.9

LAC is also referred to as the planning curve. At the falling phase a falling phase of SAC is tangent to LAC, at constant phase, SAC is tangent to LAC at constant or minimum point and at rising LAC, only a rising phase of SAC is tangent.



13.4.2 LONG RUN MARGINAL COST :

Marginal cost measures the change in total cost resulting from any expansion or contraction in activity. It is the change in total cost that accompanies one unit change in output.

$$MC = \frac{TC}{Q}$$

Long run MC depends upon the input prices and marginal products of inputs. If we draw long run MC curve, we find that it lies below the average cost curve to the left of the minimum point of the LAC, to the right of the minimum point, LMC is above LAC and at the minimum point, LMC is equal to LAC.

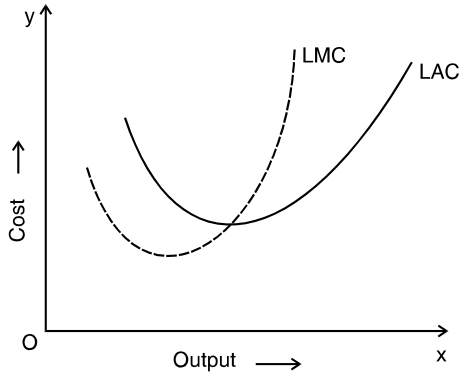


Fig. 13.10

Test Your Knowledge

Q. 1 What is the difference between explicit and implicit costs ? Should both be considered for the optimal production decision making by the firm ?

Q. 2 Explain the concepts of fixed cost, variable cost and total cost. Are they relevant to each other? Illustrate them through curves. Is the distinction between the fixed costs and variable cost relevant in the long run?

Q. 3 What is the relationship between average cost and marginal cost? If the MC is rising, does it mean that AC must also be rising?

Q. 4 Briefly discuss the factors affecting the shape of the long run average cost curve.

Q. 5 Explain the following concepts of costs with the help of curves :

a) Average Fixed Cost (b) Average Variable cost

c) Average Total Cost d) Marginal Cost

FURTHER READINGS :

6. Dwivedi,D.N : *Micro Economics*; Pearson Education, New Delhi.
7. Ahuja, H.L. : *Modern Micro Economics*, S.Chand, New Delhi.
8. Chopra, P.N. : *Principles of Economies*, Kalyani Publishers, New Delhi.
9. Seth,M.L. : *Principles of Economies*; Lakshmi Narian Aggarwal, Agra.
10. Mithani, D.M. : *Economic Theory Micro Analysis*, Hmalaya Publishers, Bombay.

MARKET FORMS–PERFECT AND IMPERFECT MARKETS

OBJECTIVES

After going through this lesson, you should be able to :-

- understand the concept of market ;
- analyse different forms of market;
- define perfect market and imperfect market;
- differentiate between perfect and pure market;
- understand different types of imperfectly competitive markets.

STRUCTURE

14.1 MEANING OF MARKET

Market is a place where buyers and sellers meet to exchange their commodities. It may be a local market or an international market. However, a market need not be a formal place. Any mechanism by which desires of the potential buyers of some specific product are made known to the potential

sellers and through which trade is arranged between the two would amount to market. Thus, in simple terms market may be defined as the sum total of all contracts between buyers and sellers of a product or commodity. A market may be very small or may be so large as to include the whole world.

14.2 FORMS OF MARKET

There are two market forms :–

Perfect Market and

Imperfect Market

14.3 PERFECTLY COMPETITIVE MARKET

Perfect competition is said to prevail where there is a large number of firms producing a homogeneous product. It is a market structure characterized by a complete absence of rivalry among the individual firms. The maximum output which an individual firm can produce is very small as compared to the total demand of the industry's product so that a firm cannot affect the price by varying its supply of output. No individual firm in it is in a position to influence the price of the product. So firm is a price taker.

According to Bials, “the perfect competition is characterised by the presence of many firms. They all sell identically same product. The seller is a price taker.”

Large number of buyers and sellers :

This market includes a large number of firms so that each individual firm, however large, supplies only a small part of the total quantity offered in the market. The buyers are also numerous, so that no one can influence the price.

Product homogeneity :

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 deliveries are identical. There is no way in which a buyer could differentiate among the products of different firms.

Free entry and exit of firms :

There is no barrier to entry or exit from the industry. Entry or exit may take time, but firms have freedom of movement in and out of the industry.

Profit Maximization :

The goal of all firms is profit maximization.

No Govt. Regulation :

There is no govt. regulation or intervention in the market in the form of tariffs, subsidies, rationing of production etc.

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

Perfect mobility of factors of production :

The factors of production are free to move from one firm to another throughout the economy.

Perfect knowledge :

It is assumed that all sellers and buyers have complete knowledge of the conditions of the market. Information is free and costless.

No transport cost :

In this market structure, transport cost is ignored.

14.4 IMPERFECTLY COMPETITIVE MARKET

Imperfect competition is an important market category wherein individual firms exercise control over the price to a smaller or larger degree depending upon the degree of imperfection present in a case. Control over price of a product by a firm and therefore, the existence of imperfect competition can be caused either by the 'fewness' of the firms or by the product differentiation. Therefore it has several sub categories.

Monopolistic Competition :

Monopolistic competition is characterised by a large number of firms and product differentiation. That is, in monopolistic competition, a large number of firms produce somewhat different products which are close substitutes of each other. As a result, demand curve facing a firm under monopolistic competition is highly elastic and this indicates that firm in it enjoys some control over the price.

Monopoly :

Monopoly is a market structure in which there is a single seller, strong there are no close substitutes for the commodity it produces and there are strong barriers to entry.

Pure Oligopoly :

Oligopoly is a market structure in which there are only a few sellers. Oligopoly without product differentiation is known as pure oligopoly. Under it there is competition among the few firms producing homogeneous or identical product. Fewness of the firms ensures that each of them will have some control over the price of the product.

Oligopoly with product differentiation :

It is characterised by competition among the few firms producing differentiated products which are close substitutes of each other. Its demand curve is down ward sloping,which means the firms would have fairly large control over the price of their individual products.

SELF-ASSESSMENT EXERCISE

Q.1. What is meant by market ? What are the main forms of market?

Q.2. What is perfectly competitive market ? Explain its assumptions.

Q.3. What is imperfectly competitive market ? What are its different types? Explain briefly.

FURTHER READINGS

Micro Economics, Theory and Practice By D.N. Dwivedi

Principles of Economics By Prem J. Bhutani

Principles of microeconomics By H.L. Ahuja.

EC 101

Semester - I **LESSON No. 15**

EQUILIBRIUM OF THE FIRM— PERFECT COMPETITION

OBJECTIVES

After going through this lesson, you should be able to

- understand the basic philosophy of perfect competition.
- differentiate between short run and long run equilibrium;
- show equilibrium of the firm under identical cost conditions and differential cost condition in the short run;
- show equilibrium of the firm under identical cost conditions in the long run; and
- to understand the shut down point of the firm under perfect competition.

STRUCTURE

EQUILIBRIUM OF A FIRM UNDER PERFECT COMPETITION

15.1 MEANING

Perfect competition is a market structure characterised by a complete absence of rivalry among the individual firms. Thus perfect competition in economic theory has a meaning diametrically opposite to the everyday use of the term. In practice, businessmen use the word competition as synonymous to rivalry. In theory, perfect competition implies no rivalry among firms.

According to Bilas, "the perfect competition is characterised by the presence of many firms. They all sell identical product. The seller is a price taker".

15.1.1 Assumptions

a) Large number of buyers and sellers

b) Product homogeneity

c) Free entry and exit of firms.

d) Profit maximisation.

e) No Govt. Regulation

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 additional assumptions.

f) Perfect mobility of factors of production

g) Perfect knowledge

h) No transport cost.

15.2 EQUILIBRIUM OF THE FIRM IN THE SHORT RUN

Short run means a period of time within which the firms can alter their level of output only by increasing or decreasing the amount of variable factors such as labour and raw materials, while fixed factors like capital equipment remain unchanged. Under perfect competition, an individual firm has to accept the prevailing price as given. As a result, demand curve or average revenue curve of the firm is a horizontal straight line. Since perfectly competitive firms

sell additional units of output at the same price, marginal revenue curve coincides with average revenue curve. Marginal cost curve as usual is U-shaped. The firm will be in equilibrium where the following two conditions are fulfilled.

(i) MR = MC and

(ii) Slope of MC > slope of MR i.e.

MC curve must cut the MR curve from below.

15.2.1. Identical cost conditions :

Identical cost conditions imply that all firms are facing same cost conditions.

Situation of equilibrium and profit :

In Fig. 1 SAC and SMC curves are short run average cost and short run marginal cost curves. Point E is the equilibrium point in the fig. as both the conditions are satisfied. At E, marginal revenue curve is exactly equal to the marginal cost curve and MC is cutting MR curve from below.

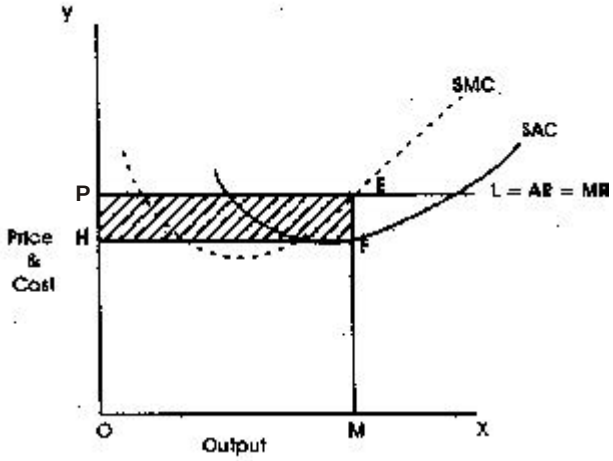


Fig. 1

At OM output, AR is equal to ME and AC is equal to MF

Profit per unit = AR – AC

= ME – MF = EF

Total profit = EF × HF = PHFE

Situation of equilibrium and loss :

In fig. No. 2, the firm is in equilibrium at a point E at which both the conditions are satisfied. The firm would be producing

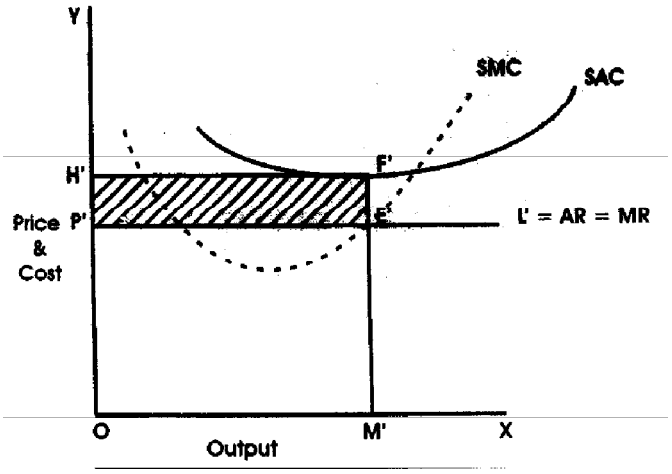


Fig. 2

OM^1 output but would be making losses. In this case AR is less than the AC.

Loss per unit = AC – AR

$= M^1F^1 - M^1E^1 = F^1E^1$

Total loss $= F^1E^1 \times P^1E^1 = P^1E^1F^1H^1$

In this case, the SAC = AR. It is a no profit no loss situation Fig. 3.

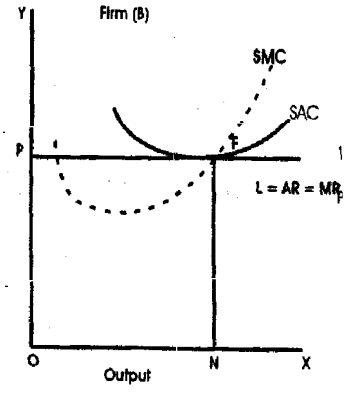
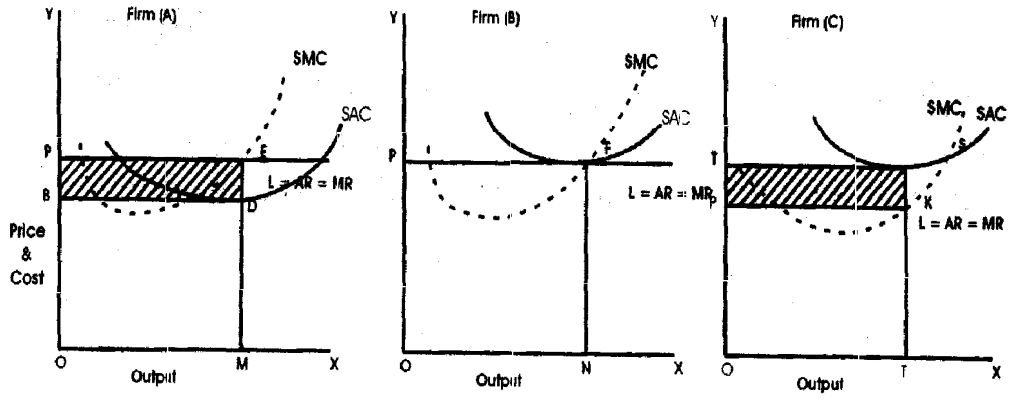


Fig. 3

15.2.2 Differential cost conditions :

Under differential cost conditions, one firm may have a higher cost of production, while the other may have a lower cost at the same time. It makes a difference in the profits earned or losses incurred by the firms. It is due to the fact that the firms are using different quality of raw materials, different techniques, there are differences in efficiencies of managers or sizes of plants etc.



If the price in the market is OP, then the firm of every category will adjust where price OP equals its marginal cost. Equilibrium points of the firm are :-

Firm (A) = E with output OM

Firm (B) = F with output ON

Firm (C) = K with output OT in Fig. No. 3

Firm (A) is getting super normal profit equal to PBDE, Firm (B) is getting just normal profit because normal profits are included in cost and Firm (C) is bearing losses equal to PKST.

15.3 LONG RUN EQUILIBRIUM OF THE FIRM

The long run is a period which is sufficiently long to allow the firms to make changes in all factors of production. In the long run, all factors are variable. New firms can enter the industry and the existing firms can leave the industry. In the long-run, none of the firms in the industry can earn super normal profits. If some of the firms in the industry earn super normal profits,

then firms from other industries will shift to this industry. As a result, there will be an increase in the supply of the product. This will bring down the price of the product.

Equilibrium of a competitive firm, in the long run is based on the following conditions.

(i) MC= MR

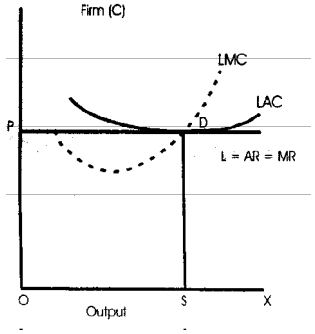
(ii) Slope of MC > Slope of MR i.e.

MC curve must cut the MR curve from below.

15.3.1 Identical cost conditions :

In fig No. 4 D is the equilibrium point as both the conditions are satisfied. At this point MC is also equal to AC. This means that under identical cost conditions in the long run, all the firms are earning normal profits.

Thus, OS is the equilibrium output. At this point the firm is earning just normal profit.



15.3.2 Differential Cost Conditions :

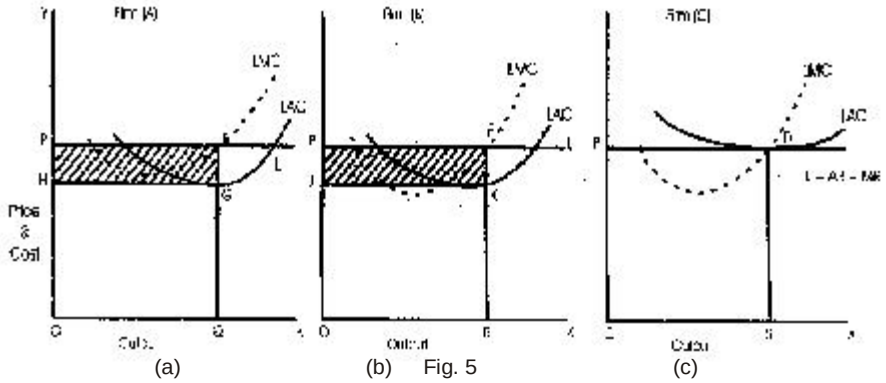


Fig. 5

Fig. No. 5 represents long run equilibrium of three firms (A), (B) and (C) which are of three categories in respect of cost conditions. The output of firm (A) is more than (B) and output of (B) is more than the firm (C). The price prevailing in the long run is OP which equals marginal cost of firm (A) at output OQ, marginal cost of firm (C) at output OR and marginal cost of firm (C) at output OS. Besides, price OP is greater than average cost at equilibrium outputs of intra-marginal firms (A) and (B) and therefore they make super normal profits. A marginal Firm i.e. firm C earns normal profit and will be first to leave the market.

15.4 SHUT DOWN POINT OF THE FIRM UNDER PERFECT COMPETITION

Can a firm stay in the industry if the market price does not cover its average cost of production? The answer is that the firm shall continue to stay in the industry in the short period even if the price does not cover its average cost of production because it cannot withdraw its fixed equipment like plant and machinery from production. The firm will continue to stay in production so long as the market price covers its variable costs. The price may not cover its fixed costs in the short period. The firm does not mind this, because it knows that fixed costs will continue to be incurred even if it temporarily closes down. The firm will not lay stress on the average fixed costs in the short run.

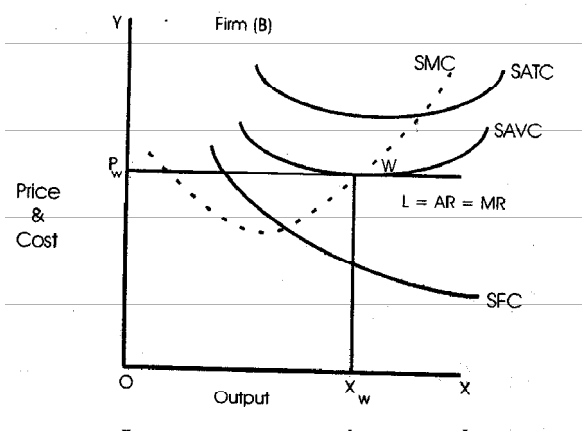


Fig. No. 6

But the variable cost must be met even in the short period. If the price in the short period falls so low that it does not cover even the firm's variable costs, then the firm has no alternative except to close down.

So the firm will continue to stay in the industry in the short period if the market price at least covers its variable costs. This has been shown in the fig. 6 above.

The point at which the firm covers its variable costs is called 'the closing down point'. In fig No. 6 it is denoted by point W. If price falls below P the firm does not cover its variable costs and it is better off if it closes down. The AFC has no significant role in the short run because fixed costs do not vary with output. The firm will not be very anxious to recover them immediately.

SELF ASSESSMENT EXERCISE

Q.1 State and illustrate the conditions of a firm's equilibrium under perfect competition.

Q.2 Examine a firm's price output equilibrium under perfect competition in the short run.

Q.3 Analyse carefully the conditions of equilibrium of the individual firm under perfect competition both in the short run and long run periods. Illustrate your answer with diagrams.

Q.4 Examine a firm's price output equilibrium under perfect competition in the long run.

Q.5 State the assumptions of perfect competition. Explain also the shut down point of the firm under perfect competition.

FURTHER READINGS

1. Principles of Economics by Prem J. Bhutani
2. Economic Theory of Micro Analysis by D.M. Methani
3. Modern Micro Economics by A. Kautsoyainnis.

EC 101

Semester - I **LESSON No. 16**

MONOPOLY AND PRICE DISCRIMINATION

OBJECTIVES

After studying this lesson you should be able to :–

- make conceptual analysis of monopoly;
- differentiate between long and short run equilibrium;
- understand situation of equilibrium, profit and loss in the short run;
- know price discrimination and its conditions;
- differentiate among first, second and third degree price discrimination.

STRUCTURE

PRICE OUTPUT DETERMINATION OF THE FIRM UNDER MONOPOLY

16.1 MEANING

The word monopoly is made up of two syllables- 'Mono' and 'Poly'. 'Mono' means single and 'Poly' means sellers in Greek Language. If there is only one single seller of a product, that situation will be referred to as monopoly. But this is only a literal meaning of the term monopoly. Actually, the term 'Monopoly' is linked with the degree of competition prevalent in the market. If in a market there is one single seller of a product and there is no competition at all, the situation will be of monopoly.

16.1.1 Definitions :

Acc. to Marshall, "There is a monopoly in every case in which single person or association of persons has the power of fixing either the amount of commodity that is offered for sale or the price at which it is offered."

Acc. to Benham, "monopoly means the only seller and the power of monopoly has complete control over supply line."

Acc. to Chamberl in, "monopoly is an economic condition of the market in which one seller or many sellers combined together in the market produce a commodity and they have an appreciable control over supply line.'

16.1.2 Conditions :

A market situation to be a monopoly market must satisfy the following three conditions :

(i) Monopolist is a sole supplier, in the market, of that commodity. There is no difference between a firm and the industry. A monopoly industry is single

firm industry.

(ii) Close substitutes of the commodity supplied in the monopoly market are not available.

(iii) There are effective restrictions on the entry of new firms in a monopoly market.

16.1.3 Assumptions :

The concept of monopoly market situation is based on the following conditions:

(i) There are large number of buyers in the market such as none of them can individually influence the price of the product therefore they have to accept the price as determined by the monopolist.

(ii) The consumer is a rational person, who wants to maximise his satisfaction.

(iii) The objective of the firm under monopoly situation is to maximise its total profits.

(iv) Under monopoly, there is no difference between the firm and industry.

(v) Complete absence of competitors.

16.2 SHORT RUN EQUILIBRIUM UNDER MONOPOLY

Short period is a time period in which monopolist divides factors of production in two parts- fixed and variable factors. Production can be increased only by changing the variable factors of production. In this period , volume of production can be changed but capacity of the plant cannot be changed.

Two conditions for equilibrium :

(i) The intersection point between MC and MR curves.

(ii) The MC curve cuts the MR curve from below i.e. the slope of MC is greater than MR.

The demand curve of a monopolist slopes downward. It means that a monopolist can sell more of his output only at a lower price. This tells us that AR or price goes on falling as sales are increased. When AR slopes downward, MR always lies

below AR. Under monopoly, cost curves are as usual 'U' shaped.

In the short period, a monopolistic firm can earn supernormal profits, normal profits or losses. These three cases of monopoly can be shown with the help of three diagrams.

16.2.1 Situation of equilibrium and super normal profit :

In the fig No. 1, K is the equilibrium point because at this point, firm's SMC is equal to its SMR and SMC is cutting SMR curve from below. RO is the firm's equilibrium price and OQ is its total output.

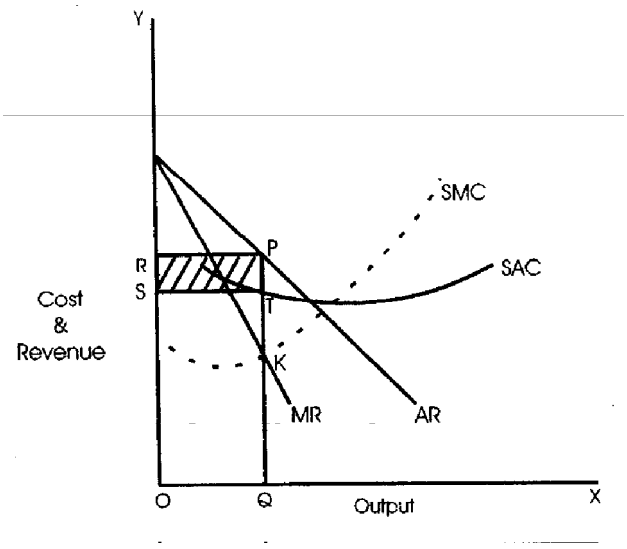


Fig. No 1

Profit per unit = AR – AC

= QP – QT = TP

Total Profit = TP × ST = RSTP. Thus total super normal profit is RSTP in the figure no. 1

16.2.2 Situation of normal profit :

In Fig. No. 2, K is the equilibrium point. OQ is total output and SO is equilibrium price (AR).

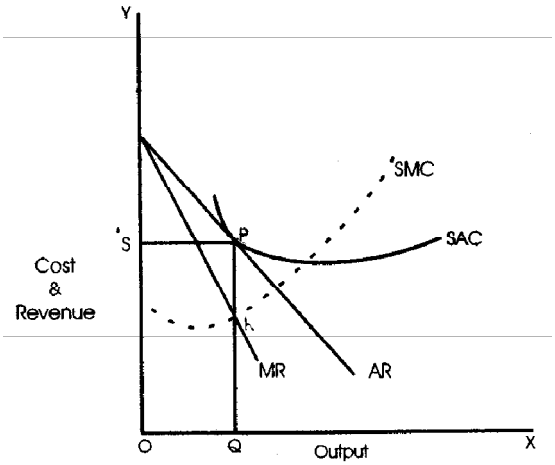


Fig No. 2

SAC is also equal to AR So firm is earning just normal profits since normal profits are included in SAC.

16.2.3 Situation of Loss :

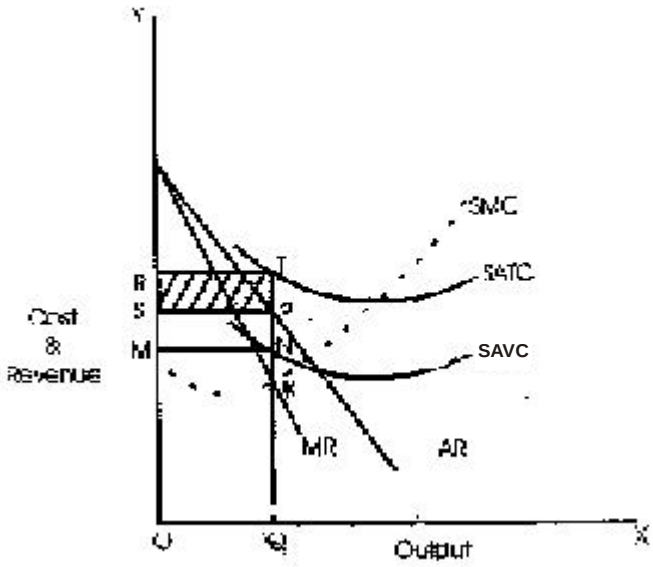


Fig No. 3

In fig. No. 3 equilibrium price is OS and output is OQ. Its AC at this level

is TQ which is greater than its AR by PT per unit but AR i.e. PQ is greater than its AVC QN. Thus the firm is covering all its variable cost. But it is able to recover only a part of its fixed costs. So the firm suffer losses.

Loss per unit = PT

Total units = PT × SP = RSPT

The variable cost covered by the firm is SMNP.

16.3 EQUILIBRIUM OF THE FIRM IN THE LONG RUN

In the long run, all factors of production are variable because monopolist has enough time to alter all the factors of production. Monopoly firm is in equilibrium at a point where its long period MC is equal to its MR. MC is also cutting MR from below. In the long run, a monopoly firm's AR is always greater than its AC.

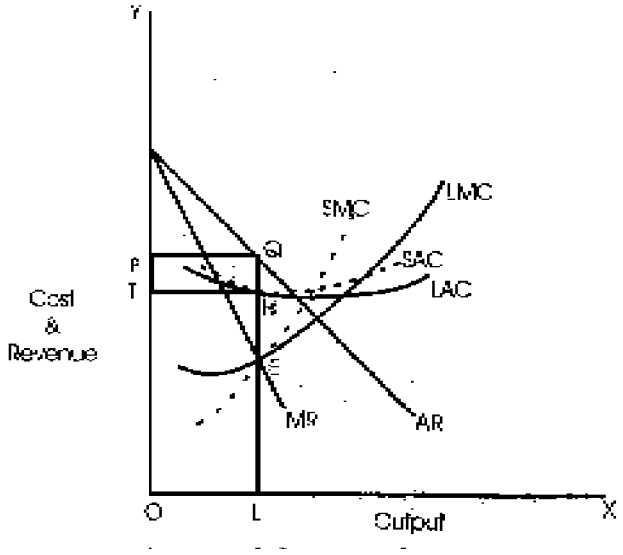


Fig. No. 4

It means that a monopoly firm always earns super normal profits because new firms cannot enter the industry. It cannot suffer losses in the long run because it will shut down production.

In Fig. No. 4 monopolist is in equilibrium at point E where LMC cuts LMR at OL output given the level of demand, monopolist will choose the plant size whose short run average cost and short run marginal cost curves are SAC and SMC. Monopolist is charging price equal to OP.

Profit per unit = AR – AC

= QL – HL = QH

Total profit QH × TH = PTHQ.

16.4 PRICE DISCRIMINATION

Meaning :

A simple monopolist charges one single uniform price for all units of its product from all the customers. But sometimes, a monopolist would like to charge different prices from different customers for the same product at the same time. When a monopoly firm resorts to this type of practice, it is called discriminatory monopoly or price discrimination.

16.4.1 Definitions :

According to Joe S. Bain, "Price discrimination refers strictly to the practice by a seller of charging of different prices from different buyers for the same good."

According to Mrs. Joan Robinson, "Price discrimination means the act of selling the same article produced under single control at a different price to the different buyers."

16.4.2 Conditions :

(i) Separate Markets :- Owing to market imperfections, when total market is divided into sub-markets, each submarket acquires a separate identity so that one sub-market has no connection with the others.

(ii) Apparent product differentiation :- Through artificial differences in the same product, such as packing, brand name etc. a product differentiation may be created, so that it can be sold to the poor and the rich consumers at different prices. Then, it is tolerated by buyers.

(iii) Buyer's illusion :- When consumers have an irrational attitude that high priced goods are always highly qualitative, a monopolist can resort to price discrimination.

(iv) Prevention of re-exchange of goods :- Wide geographical distance, high cost of transport, national frontiers, tariffs effectively prevent exchange of goods between buyers.

(v) Non-transferability Characteristics of goods and Services :- There are some goods and services which by their very nature are non-transferable between one buyer and another.

(vi) Let-go attitude of buyers :- When price differences between two markets are very small, the consumers do not think it worthwhile to consider such discrimination.

(vii) Legal sanction :- When, in some cases, price discrimination is legally sanctioned, the transfer of use of the produce is legally prohibited in order to make it effective e.g., if electricity for domestic purposes is used for commercial purposes, the customer is liable to penalties.

16.5 DEGREE OF PRICE DISCRIMINATION

The extent of mode of price discrimination depends on circumstances. Prof. A.C. Pigou, distinguished between three degrees of price discrimination way.

(i) First degree price discrimination.

(ii) Second degree price discrimination.

(iii) Third degree Price discrimination.

16.5.1 First degree price discrimination :

In this case, the monopolist is supposed to know the maximum amount of money each consumer will pay for any quantity. He then sets his prices accordingly and extracts from each consumer the entire amount of consumer's surplus in the form of revenue and profit. Mrs. Joan Robinson describes this as, "perfect discrimination". It is possible only when buyers are few and the monopolist fully

knows what maximum they would pay for each unit of his product. This discrimination is a rare phenomenon.

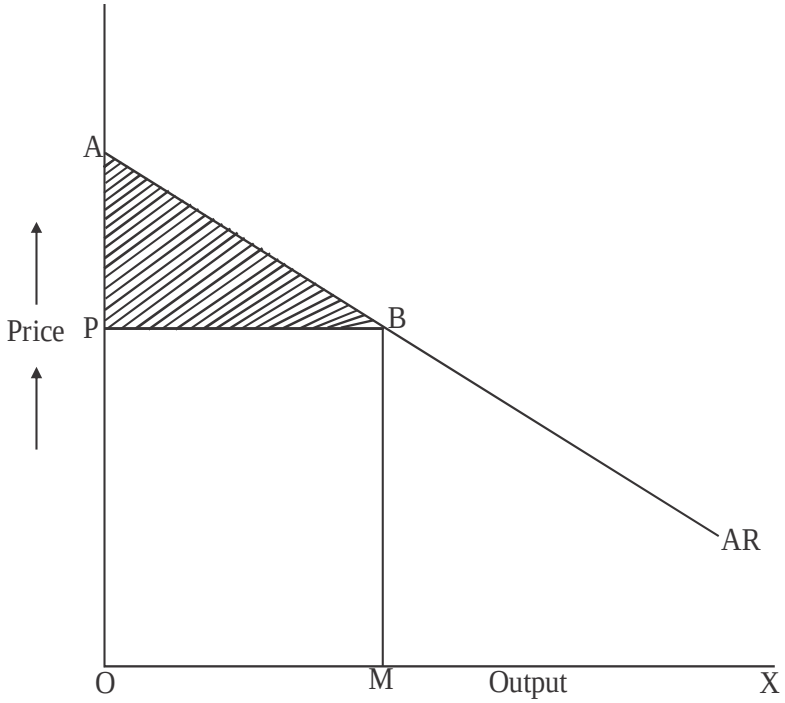


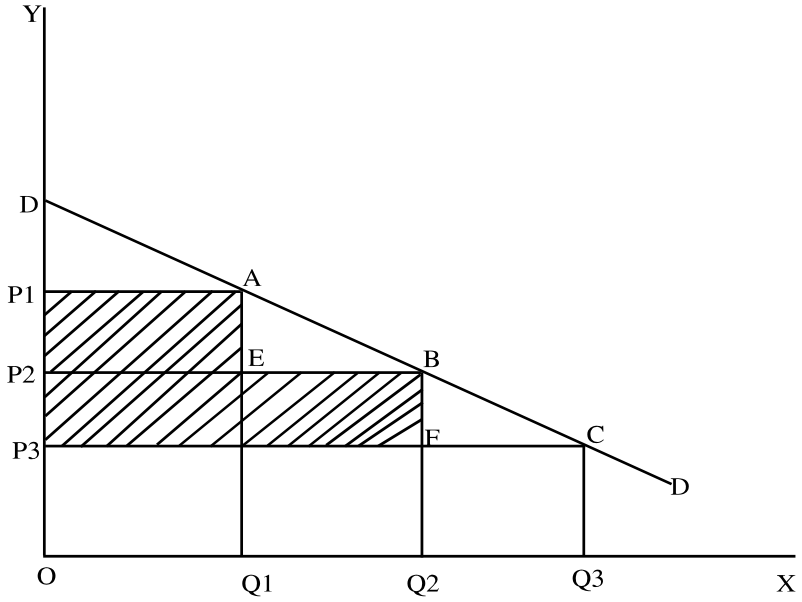
Fig. No. 5

In the fig. No. 5, the consumers would have purchased OM units of output in the absence of price – discrimination by spending the amount shown by the area OPBM, the uniform price changed being OP. Since the monopolist is able to charge every consumer a price which he is willing to pay rather than go without the product, he is able to extract the total revenue ABMO. Thus, he is in a position to extract from the consumers their surplus equal to the area APB.

16.5.2 Second degree discrimination :

It occurs where a monopolist sets different prices for different customers but does not fully exploit their potential demand prices so that the monopolist captures only parts of his customer's surpluses and not whole of it. This is possible when the total market for the product is very wide, with a large

number of buyers having different tastes, different incomes etc. so that sub groups of the buyers can be easily made.



Quantity (Output)

Fig No. 17.5

In Fig. No. 6, DD is the demand curve and the monopolist produces output OQ_3 which can be sold at OP_3 uniform price. Then the total revenue of the monopolist would be $OP_3\ CQ_3$. But if price discrimination is adjusted, total revenue can be enhanced. The market demand may be divided into three groups. Their limits are represented by points to A,B, and C. Thus, OQ_1 amount to be sold in the first group at $OP_1\ Q_1\ Q_2$ to group II with P_2 price and Q2 Q_3 to group III with OP_3 price. Thus, total revenue will be $OP_1AQ_1 + OP_2BQ_2 + OP_3CQ_3$ = area $OP_1AEBFCQ_3$ which is greater than $OP_3\ CQ_3$.

16.5.3 Pricing and output equilibrium under discriminating monopoly (Third degree) :

Even though circumstances may favour price discrimination, it may not be always profitable for the monopolist. Price discrimination is a profitable

preposition to a monopolist only when he deals with different markets with different elasticities of demand. This is confined to third degree price discrimination which is also very practical method.

Assuming a third degree price discrimination, the price discriminating monopolist has to decide :

(i) The total output to be produced;

(ii) The distribution of the supply of output in different markets i.e., how much to sell in each market with a view to maximising profit.

(iii) The prices of the product is different in markets.

Equilibrium conditions :

(i) To determine total output, the monopolist should equate marginal cost (MC) with the combined marginal revenue (EMR) of different markets.

(ii) To maximise profits, the total output in different markets will be distributed in such a way that MR in each market is same.

(iii) Price in different markets will be decided in relation to the quantity of output allocated for sale and the position of the demand curve. A higher price is fixed for inelastic demand market and a lower one for elastic demand market. Thus, lesser quantity will be supplied to the inelastic demand market and larger one in the market with elastic demand.

The Model :- To explain the equilibrium conditions, we may assume a simple model as follows :-

(i) the monopolist is facing two separate markets I and II.

(ii) The demand for the product in market I is relatively inelastic i.e., $Ed1<1$

(iii) The demand for the product in the market II is relatively elastic i.e., $Ed2 >1$.

(iv) The motive of price discrimination is the maximisation of total profits.

Under these assumptions, comparing the per unit costs and revenue conditions, the equilibrium level of output can be reached by the monopolist when the

AC equals the combined MR as shown in fig. No. 7 Panel C.

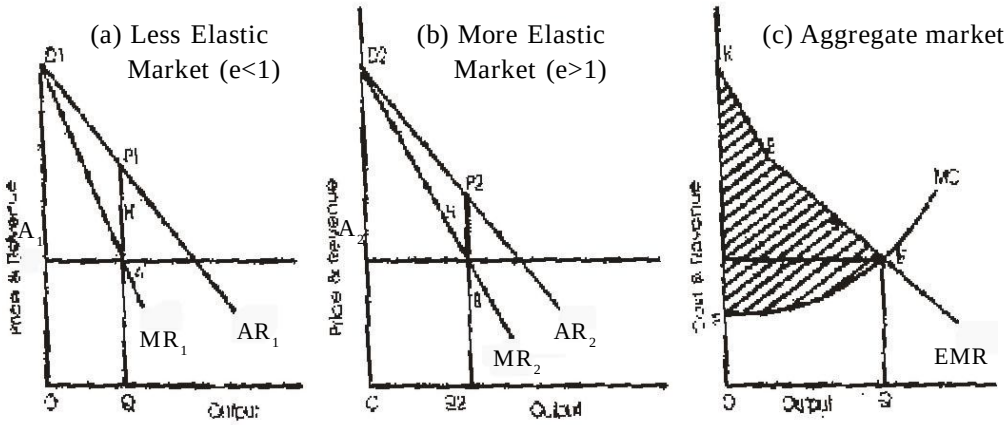


Fig No. 17.7

Fig. 7 represents the conditions of market I. D_1 represents the demand curve, which is relatively inelastic. AR, and MR are the respective average and marginal revenue curves of the market I. Panel (B) represents market II. Its demand curve is D_2, which is relatively elastic. AR_2 and MR_2 are its average and marginal revenue curves. Panel (C) represents the condition of aggregate market of the monopoly firm EMR represents combined marginal revenue curve. EMR = MR_1 + MR_2. The MC curve represents the marginal cost of output. At point E, the MC curve intersects EMR curve. It is the profit maximising equilibrium condition. OQ is the equilibrium output. The monopolist now allocates the OQ output in such a way that $MR_1 = MR_2$. To determine this, a horizontal line AE is drawn. The line AE crosses MR_1 curve at point (a) and ME_2 curve at point (b). Correspondingly, OQ_1 and OQ_2 output are determined for allocation in these two markets. When OQ_1 is allocated to market I in relation to its demand curve AR_1, P_1Q_1 price is obtained. Similarly, when OQ_2 is to be sold in market II, P_2Q_2 can be the price to have this much demand in market II. It is easy to see that MR_1 for OQ_1 output is $AQ_1 = OA_1$, MR_2 for OQ_2 output is $BQ_2 = OA_2$. Again $OQ_1 + OQ_2 = OQ$ and EMR for OQ is EQ = OA. Therefore EMR = MR_1 + MR_2.

In short, OQ is the total output determined, where MC = EMR. It gives total profit shown by the areas between the EMR curve and the MC curve. Thus, shaded area KBEF measures total profits.

SELF ASSESSMENT EXERCISE

Q.1 Define monopoly. How does a firm attain equilibrium under monopoly?

Q.2 What is monopoly ? How does a monopoly firm attain equilibrium in the short and long run?

Q.3 Explain situation of super normal profit, normal profit and loss of a firm under monopoly in the short run with the help of diagrams.

Q.4 What is discriminating monopoly? What are the degrees of price discrimination?

Q.5 What is price discrimination? Under what conditions is it possible and profitable?

Q.6 Explain fully the conditions which should be fulfilled if a discriminating monopolist is to be in equilibrium? Illustrate your answer with diagrams.

FURTHER READINGS

I Principles of Economics

by Prem J. Bhutani

II Economic Theory Micro Analysis

by D.M. Methani

III Modern Micro Economics

by A. Kautosoyinannis.

EC 101

Semester - I **LESSON No. 17**

MONOPOLISTIC COMPETITION

OBJECTIVES

After studying this lesson, you should be able to :–

- analyse monopolistic competition as one of the forms of market structures and its features.
- differentiate between short and long equilibrium;
- understand group equilibrium; and
- explain situation of super normal profit, normal profit and loss of firm in the short run.

STRUCTURE

17.1 MEANING

Monopolistic competition is a market structure that is characterised by a large number of firms with differentiated products. These products are heterogeneous but highly substitutable. The area of product and services differentiation gives each

seller a chance to attract business to himself on some basis e.g. through advertisement etc. So there is more focus on non-price competition. Since he differentiates his product, he acts as a monopolist for his product, still his control is limited. That is why, this is a market where one has monopoly over one's product but still faces competition.

17.1.1 Definitions :

According to Joe S. Bain, "monopolistic competition is found in the industry where there is a large number of small sellers, selling differentiated but close substitute products".

According to Leftwitch, "monopolistic competition is a market situation in which there are many sellers of a particular product, but the product of each seller is in some way differentiated in the minds of consumers from the product of every other seller".

17.1.2 Features :

(i) Large number of buyers and sellers :- There are large number of buyers and sellers in a monopolistic competition market who individually have a small share of the market.

(ii) Product differentitation :- This means that the products of various firms are not identical but they act as close substitutes. Every seller has a monopoly on his own differentiated product but has to face stiff competition from the sellers of substitute products.

(iii) Free entry and exit :- New firms are free to enter into the market and existing firms are free to quit it.

(iv) Imperfect knowledge :- The existence of monopolistic competition depends upon imperfections in the knowledge of the buyers. The products may really be the same but consumer may come to know a particular brand's name more than the others.

(v) Price Policy :- Another feature is that the firm has a price policy under monopolistic competition.

(vi) Selling costs :- Selling costs are a unique feature of monopolistic competition. Since products are differentiated and may be varied from time to time, advertisements, discounts, better distribution systems, efficient after sale services etc. become an integral part in marketing the products. Outlays incurred on this account are termed as selling costs.

17.2 PRICE OUTPUT DETERMINATION UNDER MONOPOLISTIC COMPETITION

The fact that each firm produces a differentiated product from competing products means "that some people prefer it to other products, even though it is somewhat expensive. As the firm raises the price, it can expect that few customers will buy its products and when the firm reduces its price, the firm can expect to attract more customers. Thus the firm faces a downward sloping demand curve for its product.

17.2.1 Short run equilibrium under monopolistic competition :

In the short run, every firm has a particular demand curve of its own. If the firm produces different varieties of the product, they will be having different cost conditions. Accordingly, equilibrium prices and output will also be different for these firms. Since there are a large number of competing firms in the monopolistic competitive industry, it is generally not possible to study them in isolation. However, for the sake of simplicity, substitutes produced by rival firms and prices charged by them are held constant while equal adjustment by each firm is considered. We also assume that output will remain constant and price variable will make equivalent adjustments.

Conditions :

(i) The interaction point between MC and MR curves.

(ii) The MC curve cuts the MR curve from below i.e. the slope of MC is greater than MR.

Situation of equilibrium and Super normal profit :

Point E is the equilbirum point because both the conditions are satisfied. The demand curve DD facing the firm shows that OQ can be sold at OP price. At OQ

Level of output, Average Cost is BQ. So per unit profit is AQ-BQ = AB and total profit is ABXOQ = ABCP, the shaded area in the fig No. 1

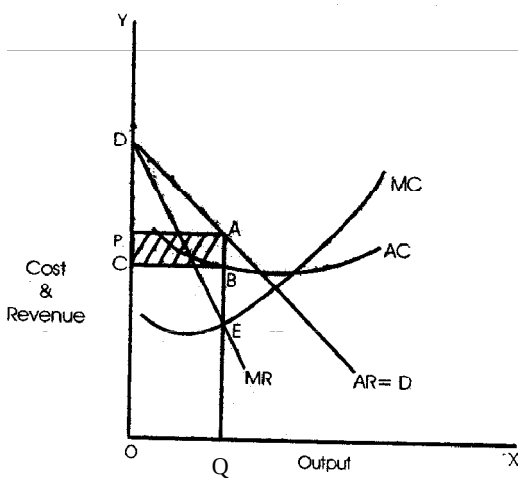


Fig No. 1

Situation of normal profit :

E_1 is the equilibrium point which determines output OM and price OP_1. Average cost is just equal to AR, so firm is earning just normal profit. Since A_1 lies to the left of the minimum point of AC, thus the firm is operating at sub-optimum capacity as in fig. No. 2

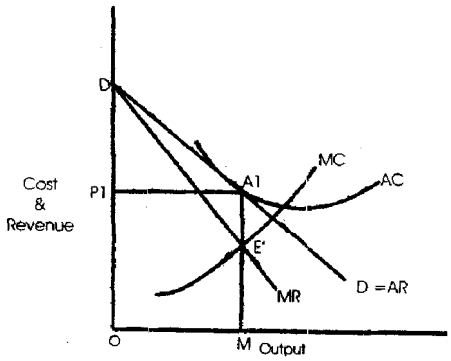


Fig. No. 2

Situation of Loss :

If conditions of market are not favourable, the firm will bear losses

also. This is shown in Fig. No. 3 where demand curve i.e. AR of the firm throughout lies below the AC curve. The firm is at equilibrium E" where MC is equal to MR. At OQ" level of output, loss per unit is Q"A"– Q"B" = A" B" and total loss of the firm is A"B" x OQ"= A"C"P"B" i.e. shaded area in the fig no. 3

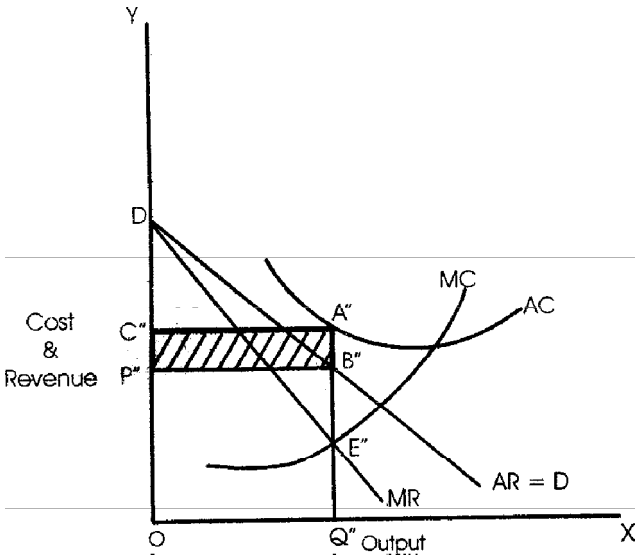


Fig. No. 3

Price and output determination in the long run or group equilibrium:

In order to arrive at the group's equilibrium, we make simplistic assumptions that both demand and cost curves for all the products are uniform throughout the group and the number of firms being large, individual's action regarding price and output adjustment will have a negligible effect upon its numerous competitors.

Let us suppose all firms are making super normal profits which will attract new firms into the market. New firms will come and start producing close substitutes. Thus, market will be shared by more firms and demand curve or AR curve for the product of each firm will shift downward. The process of entry will continue until the average revenue becomes tangent to the average cost curve and the super

normal profits are completely wiped away. Since all the firms are assumed to be alike, therefore, all are making normal profits only. Since all the firms are just covering their costs, there will be no tendency for the new firms to enter the market and the group will be in equilibrium.

SELF ASSESMENT EXERCISE

Q.1 What are the characteristic features of monopolistic competition ? Show how an individual firm will attain equilibrium in the short run?

Q.2 What are selling costs and product differentiation? Why are they peculiar in monopolistic competition?

Q.3 Explain the main features of monopolistic competition. Explain also the long run equilibrium of a firm under monopolistic competition.

FURTHER READINGS

I Principles of Economicsby Prem J. Bhutani

II Economic Theory Micro Analysis by D.M. Mithani

III Modern Micro Economics

OLIGOPOLY, SWEEZY'N MODEL OF OLIGOPOLY

OBJECTIVES

After going through this lesson, you should be able to :

- Understand the concept of oligopoly ;
- Explain the 'Kinked Demand Model';

STRUCTURE

OLIGOPOLY

18.1 MEANING

Oligopoly is a market situation in which there are only a few sellers. These sellers need not be of the same size and the products may be homogeneous or may be differentiated. In any case, no single firm controls the price, but each producer's output decisions have some impact upon the price.

The term oligopoly is derived from two Greek words, "Oligos" meaning a few and "Pollen" meaning to sell. It is present day industry. In case there are only two sellers in the market, it may be called Duopoly but this is also a special form of oligopoly because the nature of the problem is the same whether there are two or a few sellers.

The fortunes of Oligopolistic firms are mutually interdependent. When oligopolistic firm makes an output decision that influences its price, it also influences the price of its competitors. A direct effect of interdependence of oligopolists is that various firms have to employ various aggressive and defensive market weapons to maintain their shares and also to gain a greater share in the market. These firms spend a good deal of money on advertisements and other tools of sales promotion.

It is a theory of group behaviour and the members of the group may agree to pull together in promotion of common interest or they may fight for their individual interests. They may not follow a leader. But one thing is certain that each oligopolist closely watches the moves of his rivals and makes counter moves.

Because of interdependence of the firms in oligopoly and because of inability of a particular firm to predict the behaviour of other firms, it is impossible to determine his demand curve. Since his demand curve is indeterminate, finding out his equilibrium price and output are diffcult. However a number of models have been made e.g. Kinked Demand Model, Price Leadership Model etc. These models are aimed to lessen the degree of uncertainty and to predict the behaviour of different firms based on certain assumptions.

18.2 THE KINKED DEMAND MODEL

The Demand curve hypothesis was put forward independently by Paul M. Sweezy, an American economist and by Hall and Hitch, Oxford economists in 1939.

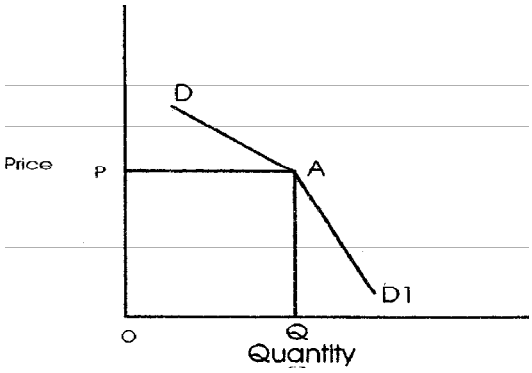


Fig. No. 1

In explaining price and output especially under oligopoly with product differentiation, economists often use the Kinked Demand Curve hypothesis. This hypothesis is illustrated in Fig. No. 1 where the demand curve is drawn with a sharp kink at price P which is prevailing price.

Suppose a firm is producing with some excess capacity. If the firm raises the price above OP, it fears none of his rivals will follow, thus causing it to lose some customers rapidly to them. On the other hand, if it cuts price, all its rivals will do the same and thus the price cutting firm will not gain much.

Thus the firm's demand curve is DAD_1; more elastic upwards and less elastic downwards. Each oligopolist will adhere to the prevailing price, seeing no gain in changing it and a kink will be formed at the prevailing price, which is strictly at this level.

Why Price Rigidity ?

(i) Changes in costs within limits do not affect the oligopoly price.

(ii) Changes in demand do not affect the oligopoly price.

18.2.1 Changes in cost within limits do not affect the oligopoly price :-

For finding the profit maximising price output combination, MR curve corresponding to the kinked demand curve D has been drawn. The MR curve associated with a kinked demand curve is discontinuous and it has a broken vertical portion. The length of the discontinuity depends upon the relative elasticities of two segments, DP and PD of the demand curve at point P. The greater the difference, the greater the length of discontinuity. In the diagram no. 2 it is HR portion. If the MC curve of the oligopolist is such that it passes anywhere through the discontinuous portion HR of MR curve, the oligopolist will be maximising his profits at the prevailing price level MP and he will be in equilibrium at point E. Since the oligopolist is in equilibrium and maximising the profits at the prevailing price level, it will have no incentive to change the price. When MC curve shifts upwards to MC_1 due to rise in cost, the equi. Price and output remain unchanged since new MC also passes through the gap HR.

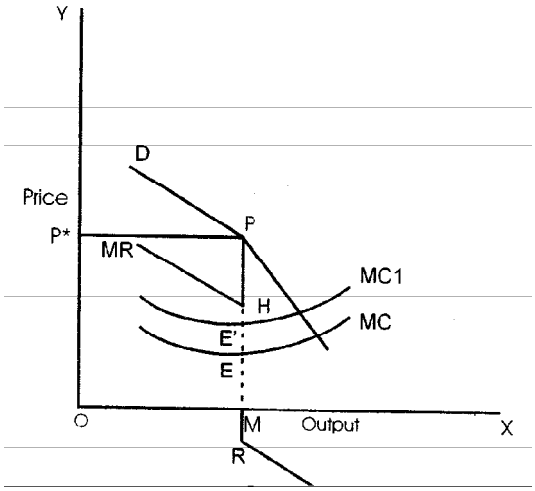


Fig. No. 2

18.2.2 Changes in demand do not affect the oligopoly price :-

As the figure 3 shows, there is a shift in the AR curve as well as MR curve. But the upward or downward shifts in. AR and MR curves do not affect the price, as long as the MC curve cuts the MR curve in the gap as shown in Fig. below.

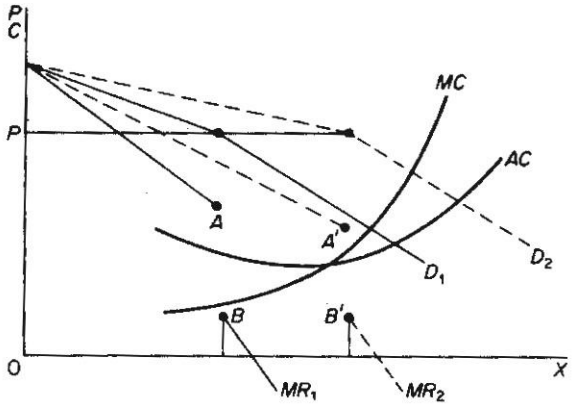


Fig. No. 3

SELF ASSESSMENT EXERCISE

Q.1. What do you know about oligopoly?

Q.2. Explain with diagram the concept of Kinked demand.

FURTHER READINGS

I. Principles of Economics
by Prem J. Bhutani

II. Economic Theory Micro Analysis
by D. M. Mithani

III. Modern Micro Economics

MARGINAL PRODUCTIVITY THEORY OF DISTRIBUTION (CLASSICAL)

OBJECTIVES

After going through this lesson you should be able to :-

- Understand the importance of marginal productivity theory of distribution.
- Determine firm and Industry's equilibrium and
- Identify shortcomings of Marginal productivity theory.

STRUCTURE

19.1 INTRODUCTION

Marginal productivity means that a factor of production should get its reward according to the contribution it makes to the total outputs. It is the work of many writers each improving, amending and modifying the ideas of the other. The origin

of the concept of M.P. can be traced to Records and Wert. But both have applied the M.P. only to land. But the idea of M.P. did not gain much popularity till the last quarter of 19th century, when it was rediscovered by economists like Wicksteed, Walrus, Clark and recently by Marshall and Hicks.

According to J.B. Clark (an American economist), "under static conditions, everyfactor including the entrepreneur would get a remuneration equal to its marginal product".

19.2 CONCEPTS

The following are the main concepts, which are helpful in order to understand the theory.

1. **Marginal Physical Productivity (MPP)**

MPP of a factor is the increase in total product resulting from the employment of an additional unit of that factor, other factors remaining constant. MPP=TPn-TPn1.

2. **Marginal Value Product (MVP)**

Value of physical product at market price is called MVP it is

MVP = MPP × Price.

3. **Marginal Revenue Productivity (MRP)**

MRP is the addition made to total revenue by employing an additional unit of a factor, quantity of other factors remaining constant.

MRP = MPP × MR.

4. **Average Revenue Productivity**

ARP is the average revenue per unit of a factor of production.

There are many versions of Marginal Productivity Theory of distribution. We shall explain here the classical version of M.P. theory.

Classical version of Marginal Productivity Theory :-

19.3 ASSUMPTIONS

(i) There is perfect competition, both in the product market as well as in the factor market.

(ii) There is no technological change.

(iii) All units of a factor are perfectly homogenous.

(iv) The firm is aiming at profit maximization.

(v) The economy is operating at a full employment level.

(vi) There is perfect mobility of factors of production.

(vii) No Govt. intervention.

(viii) The theory holds good in the long run.

(ix) All the factors are perfect substitutes for each other.

19.4 EXPLANATION

To some extent the relation between ARP and MRP is similar to the relation between AC and MC. The only difference is that MC and AC are 'U' shaped while ARP and MRP are having the shape of inverse 'U' It is because when production is increased, productivity, efficiency of the factors also increases and so the ARP and MRP are rising but beyond a point they start falling. M.P. theory explains the following main facts :-

(a) Reward for each factor unit will be equal to its marginal productivity

We know that a rational producer aims either at maximizing his profits or minimizing his losses. Every producer compares the price paid to the factor with its productivity. A producer will employ the factors upto the point where the MC of the factor equals its marginal productivity. This will be the point of equilibrium.

(b) Reward for each factor will be the same in every use

Another implication of the theory is that the MP of a factor is equal in all its uses. So factors will think it worthless to move from one occupation to another.

The condition for achieving equilibrium can be stated as :

$$\frac{\text{MRP of factor A}}{\text{Price of factor A}} = \frac{\text{MRP of factor B}}{\text{Price of factor B}} = \frac{\text{MRP of factors}}{\text{Price of factor C}}$$

(c) In the long run, under perfect competition, each factor will get its remuneration equal to its MRP which also equals its ARP.

19.4.1 Firm's equilibrium

Under perfect competition in factor market, a single firm can not affect the wage rate; wage rate is determined by the industry.

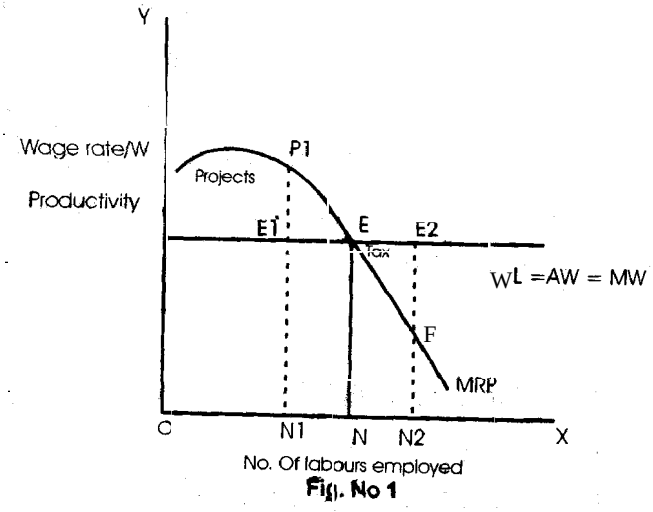


Fig. No 1

In fig. 1, WL is wage rate which is equal to AW and MW. At point E, producer will be in equilibrium as AW or MW is equal to MRP. Suppose the producer employs less workers i.e., ON_1. Here MRP is $P_1 N_1$ but wages are $E_1 N_1$ which is less than the former. So it is advisable to increase production by employing more workers. But at E_2, productivity is FW_2. and wages $E_2 N_2$ so the producer is getting losses.

19.4.2 Industry Equilibrium

The long run condition of equilibrium is that the MRP, ARP and wages should be equal. In the fig. II, E is the point of equilibrium where wage rate = AW = MW=MRP = ARP. The number of workers employed in the firm is earning only normal profit in the long run. Suppose wage rate is $O W_1$, at which the firm is

undergoing losses because wage rate is more then ARP by E_1 Q. Some firms will leave the market and the demand for workers will decrease. So wages will be reduced to OW. Similarly, at wage rate OW, ON workers will be employed. Firms will be earning super normal profits for wage rate OW_2 as it is less than ARP by E_2R.

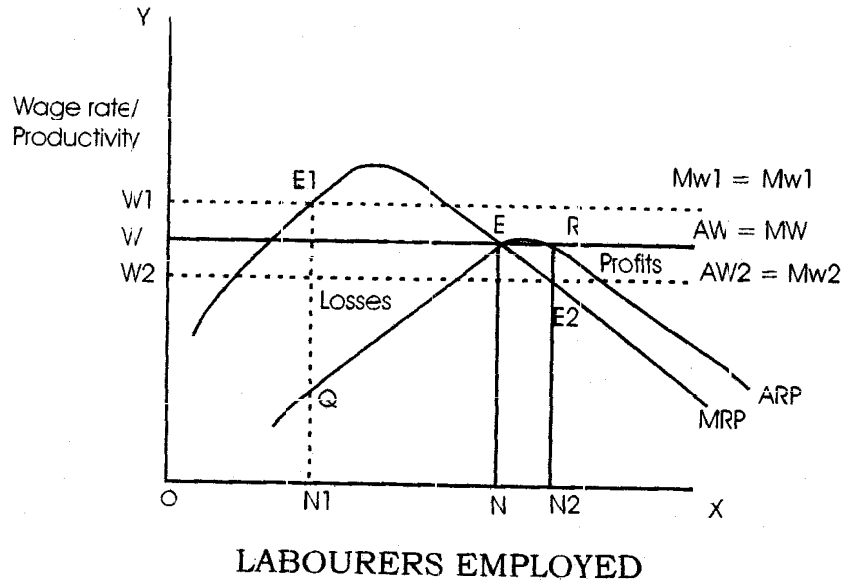


Fig No 2

New firms will be attracted. Demand for workers will increase and push their price to OW. Hence, in the long run, wages or a factor's reward is always equal to its ARP and MRP and all firms in the industry earn first normal profit so the industry reaches an equilibrium position.

21.5 CRITICISM OF THE MARGINAL PRODUCTIVITY THEORY

I. Unrealistic Assumptions

It has been argued that the assumptions on which the theory is based, do not hold good in the real world. So the theory has little importance.

II. Factor units cannot be varied

Hobson criticized the theory on the ground that the factors cannot be varied as the factors are always used in a certain fixed ratio. They cannot be changed freely.

III. Production is the result of the efforts of all the factors put together

Prof Taussing said that production results from the combined efforts of the factors. So it is not possible to find marginal revenue productivity by employing one more unit of a factor.

IV. Difficultly in the measurement of MRP

It is impossible to measure MRP by just changing the units of factor employed. The MRP of the entrepreneur cannot be estimated because, quite often, there is a single entrepreneur in a firm.

V. Short period ignored

The theory holds good only in the long period.

VI. Inter-relation between reward and productivity

The theory states that the reward of a factor is determined by its marginal productivity. But Prof Sydney Webb says the law is applicable also when reversed. When a labourer is given higher wages, his standard of living will increase, he will have good health and his productivity will increase.

VII. Classical version is one sided

The theory is also criticized because it only explains the demand side of factors. The supply side is ignored. It does not explain the factors affecting the supply of the factors.

VIII. Wages rate is not the sole determinant

According to this theory, the wage rate is the sole determinant of the volume of employment which is not correct.

IX. The assumption of Homogeneous factors is not correct

The theory assumes that all the units of a factor of production are homogeneous, which is not correct. As we know, neither two workers are equally

efficient nor two pieces of land are equally fertile.

X. Fixed proportions

When the factors are used in fixed proportions, increase in one factor keeping the others constant will not lead to any increase in total production at all. The M.P. of the factor will be zero. According to M.P.T., the reward for the factor will also be zero. This is of course not possible.

XI. Difficult to measure remuneration of entrepreneurs and top executives:

Another limitation against the theory is that, it does not explain remuneration of entrepreneurs and top executives as they are fixed factors. According to critics, power, social prestige, status and other perks play a crucial role in fixation of remunerations.

SELF-ASSESSMENT EXERCISE

Q.1. What do you know about the concept of Marginal Physical Productivity and Marginal Value Product? How they are helpful in Marginal Productivity Theory of Distribution?

Q.2. Explain equilibrium of the firm and industry in the factor market with the help of the Classical Marginal Productivity Theory.

Q.3. State and discuss critically the Classical Marginal Productivity Theory.

Q.4. How is reward of a factor say labour is determined when both the factor market and product market are perfectly competitive?

BOOKS RECOMMENDER

Micro Economics. Theory and Applications by H.L. Ahuja ;

Principles of Economics by P.N. Chopra.

Economic Theory - Micro Analysis D. M. Methani.

EC 101

Semester - I **LESSON No. 20**

THEORIES OF DETERMINATION OF WAGES AND COLLECTIVE BARGAINING: WAGE DIFFERENTIALS OBJECTIVES

After going through this lesson, you should be able to :

- Explain wage determination under collective bargaining;
- List two types of limits, upper limit sought by the union and the lower limit set by the employer;
- Show bargaining between the employer and the union to determine wage note; and
- Understand different reasons which account for differences in wages

STRUCTURE

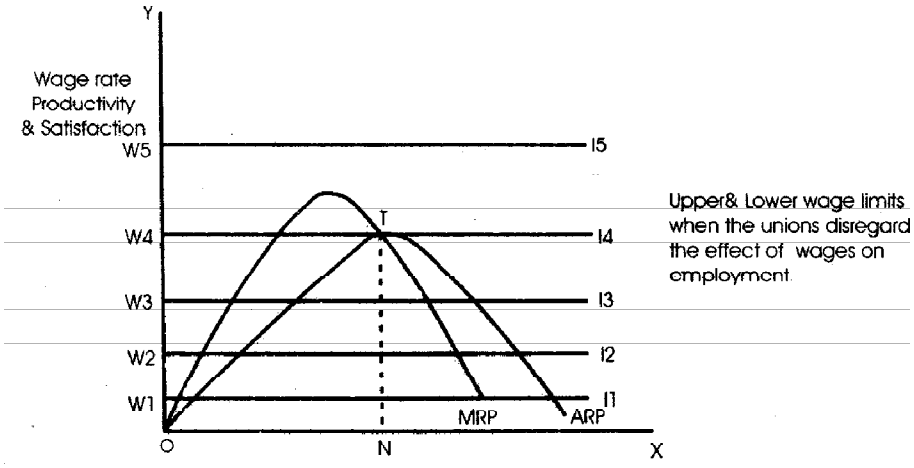
20.1 INTRODUCTION

Collective bargaining by trade union with an employer or if it is industry-wise bargaining with the employer's association represents a situation where a single seller faces a single buyer. Trade union of the firm or industry acts as a single voice representing the workers so that trade union becomes a single seller of labour to the employer. In other words trade union has the monopoly of selling labour. On the other hand, the employer, if he is monopolist or the employer's association is a single buyer of labour. Thus under collective bargaining a single buyer of labour faces a single seller of labour. Therefore, we are confronted here with special cases of bilateral monopoly and wage determination under trade unions on collective bargaining becomes a special care of price determination under bilateral monopoly. Analysis of bilateral monopoly only brings out two limits-the upper limit sought by the union and the lower limit set by the employer-within which range the wage will be fixed. Actual wage rate fixed within the range and whether it will be more nearer to the upper limit on to the lower limit depends upon the relative bargaining strengths of the union and employer.

20.2 WAGE DETERMINATION UNDER COLLECTIVE BARGAINING

In modern economic theory, it is granted that trade unions have preference functions or indifference functions between wages and employment. These indifference functions of trade union which has the monopoly of selling labour, take the place of supply (cost functions) of the monopolist in the product market.

(i) Situation I : Trade union seals to achieve the maximum possible wage rate without caring for employment :- If the union seeks to achieve the maximum possible wage rate and cares nothing about the likely effect on the employment, the indifference curves will be horizontal straight lines as shown in Fig. No. 1.



EMPLOYMENT

Fig. No. 1

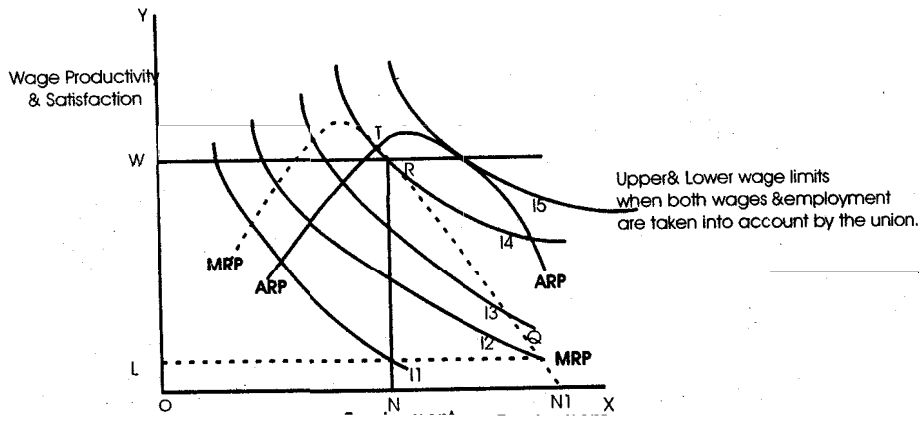
Indifference curve I shows the level of satisfaction of the union at wage rate O.W. Similarly, the levels of sales faction of the union at wage rate OW_2, OW_3, OW_4, and OW_5 are respectively represented by indifference curves I2, I3, I4 and I5. As we move upward the distance between the successive indifference curves becomes larger indicating that as the wage rate is increased, successively larger increments in wage are required to yield a constant rate in satisfaction of the union. In Fig. No 1; ARP represents average net revenue productivity curve and MRP represents marginal net revenue productivity curve. The union will seek the wage rate OW aiming to achieve the maximum possible wage rate because indifference curve I4 is tangent to the ARP. The union will not seek the wage rate above OW, because any wage rate higher than ARP will mean losses for the employer and he would rather stop production than to pay the wage rate higher than ARP. Thus OW is the upper limit of the bargaining range set by the union.

There will be a lower limit below which the wage rate cannot be set as a result of bargaining. If the employer possesses all the bargaining power, he will set the wage rate is that which is still acceptable to the union. The head of union will call union and its members to go on strike than to accept the wage below a certain limit. There will be a certain lower limit below which the wage will not

be set as a result of the negotiations between the employer and the union.

As a result of the bargaining between the employer and the union, the wage rate will be fixed anywhere between the upper and lower limits, depending upon the relative bargaining strengths of the two parties. Thus, the determination of actual wage rate under collective bargaining is indeterminate.

(ii) Trade union in its bargaining with the employer of the firm may take into account both wages and employment : because of the fear that the workers which may be rendered unemployed as a result of the wage settled may liaison against the union. It follows that the heads union is likely to seek a certain optimum consideration of wage and employment as substitutes to some extent. In such a case, preference functions or indifference curves of the union will be consent to the origin.



EMPLOYMENT

Figure No. 2

For the union though wage and employment are substitutes but they are not perfect substitutes of each other. Suppose in the negotiation it is the wage rate which is settled and the employer is free to offer the amount of employment he thinks to be most profitable at the wage rate settled, given the wage rate, the profits of the employer will be maximum at the level of employment where the given wage rate equals MRP.

The trade union will obtain maximum possible satisfaction at the point on the

given MRP to which an indifference curve of the union is tangent. It will be noticed in Fig No. 2 that the indifference curve I4 is tangent to the MRP curve at point R, the wage rate is O W, at which employer will offer an employment. Tangency point R lies below the ARP curve. At point R or the wage rate equal to the highest point I on the ARP curve will be the upper limit set by the trade union. The lower limit is Q. Where the lowest acceptable indifference curve F_2, of the union intersects the MRP curve. Therefore, the wage employment that will be determined as a result of collective bargaining will be the same where between R and Q on the MRP curve. Thus, the LW is the range in which the wage rate is indeterminate.

Thus, in Fig. No. 2, a powerful trade union is an all or nothing bargaining will insist on may be able to secure wage employment combination represented by point S where indifference curve I5 is tangent to ARP curve.

20.3 INTRODUCTION

Various theories given by different economists have tried the determination of wages. But one thing noted in reality is that wages differ from person to person, place to place, from one occupation to another and from one sex to another. The term 'wage differentials, refers to the wage differences which exists between different occupations and different individuals in the same occupation.

20.4 THE MAIN REASONS, WHICH ACCOUNT FOR DIFFERENCES IN WAGES HAVE BEEN GIVEN BELOW

(i) Difference in the demand for worker : Different workers produce different goods. The demand for various goods is also different. Some goods are demanded more while others are less in demand. Those goods whose demand is more will create more demand for these workers and vice versa. Similarly, the demand for goods differs from place to place. So wages differ from person to person and place to place due to the relative differences of demand for workers.

(ii) Differences in the efficiency of Labour : Efficiency of labour affects its wages. All workers are not alike. Some are more efficient than the others. It is president to pay higher wages to workers who make more antiquation to production, due to this also, wage differences exist.

(iii) **Differences in the supply :** By supplying of workers is meant the number of workers ready to work on the existing wage rate. In some firms more workers are ready to work than the others. It depends upon so many things i.e. chances of extra income, nature of job, chances of promotion, status of a job, hours of work etc. Due to this supply difference also, wages differ from one occupation to another.

(iv) **Differences in mobility of labour :** We know that labour is less mobile over areas due to family affection, language problem etc. Due to this, inability of labour also, wages differ from place to place and from one job to another.

(v) **Experiences and Education :** Wages differ from person to person also because the experience and education of various workers differ. Naturally those who are more educated and better trained than the others will be paid higher wages.

(vi) **Risk :** On border areas risk to life is more due to the possibility of sudden attack by the neighbouring country. That is why workers on the border demand higher wages than at other places.

(vii) **Future prospects :** In some jobs, a worker has bright future prospects on changes of promotion are more, wages can be lower than in others. In this situation, worker will prefer his present job and will accept even lower wages.

(viii) **Difference in bargaining powers :** Different workers have different bargaining powers. Some can strongly and favourably negotiate with the enterpriser. Those who have better bargaining power earn wages higher than the others.

(ix) **Regularity and Irregularity of Job :** Jobs which are permanent have lower wages than those jobs which are temporary. A worker is prepared to accept even lower wages provided the nature of the job is permanent.

(x) **Market Imperfections :** These refer to the various types of inabilities such as, geographical, sociological and artificial in nobilities which check the free

flow of labour in the various parts of the country. These in nobilities explain why different wages are paid for identical jobs.

(xi) Cost of training : There are some occupations and professions which require prolonged and expensive training before the individual concerned is permitted to practice them. His earnings must be high enough to compensate for the expensive, prolonged training that he has undergone.

(xii) Scarcity of talent : Some talents are more scare than others. Greater the society of a particular talent, the higher the reward available to it i.e. cricketers, film stars etc., earn fabulous amounts on account of their scarce talents.

Thus, the points discussed above help to explain the wage differentials that exist among different categories of workers.

SELF-ASSESSMENT EXERCISE

Q. 1. What is meant by exploitation of labour? How far can collective bargaining help to remove it?

Q. 2. What are the imperfections of the labour market? How does collective bargaining affect wage rate on employment?

Q. 3. What is collective bargaining? Can head union in its bargaining with the employer of the firm take into account both wages and employment?

Q. 4. Why do wages differ in the same occupation and in different occupations?

FURTHER READINGS

Economic Theory Micro Analysis by D. M. Mithani

Advanced Economic Theory by H. L. Ahuja

Principles of Economics by M. L. Seth

Micro Economic Theory and Application by D. N. Dwirech.

RENT–SCARCITY RENT : DIFFERENTIAL RENT, QUASI-RENT

OBJECTIVES

After going through this lesson, the student should be able to :–

- Appreciate the need for rent determination;
- Differentiate between differential rent and scarcity rent;
- Highlight the main drawback of Ricardian theory of rent; and
- Understand the concept of quasi-rent.

STRUCTURE

RICARDIAN THEORY OF RENT

21.1 INTRODUCTION

This theory was put forward by a well known British classical economist

David Ricardo. According to Ricardo, rent was a differential surplus which was enjoyed by the more fertile lands over the less fertile lands. Ricardo defined rent, as "Rent is that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil."

21.2 ASSUMPTIONS

- Long period.
- Quantity of land is fixed.
- Original power of land
- Indestructible power of land
- Law of diminishing returns operates in agriculture
- The population will keep on increasing
- The land is cultivated in a descending order. The most fertile and the most favourably situated land is cultivated first.
- Land is free gift of nature
- There is perfect competition in the market for land

21.3 TYPES OF RENT

According to Ricardo, rent is of two types :–

Differential Rent :– When land differs in quality *i.e*. fertility, the scarcity of superior grades of land will give rise to differential rent.

Scarcity Rent :– If land is homogeneous i.e., of uniform quality, the scarcity of land relative to demand will give rise to rent. Ricardo calls it scarcity rent.

Differential Rent :– To illustrate the emergence of rent, let us take the example of an uninhabited island. Let us assume that there are four types of land in the island classified as "A" "B" "C" and "D" on the basis of fertility. A is the most fertile and 'D' is the least fertile land. People from the neighbouring country come in batches to settle on the island. When the first batch of settlers comes, it will naturally occupy the 'A' quality land for the purpose of agricultural production. Let us assume that with

one dose of labour and capital, 'A' quality land yields 100 metric tons of wheat per hectare. When the second batch comes it will be faced with two alternatives either to occupy the 'B' quality land which is free or to take the 'A' quality land on rent from first batch. Let us assume that one dose of labour and capital applied to 'B' quality land yields 80 metric tons of wheat per hectare. In that case the rent of 'A' quality land would be equal to (100–80) = 20m tons because this represents the difference between the fertilities of the two lands. Even if the 2nd batch decides to cultivate 'B' quality land even then rent still arise on 'A' quality and because 'A' and 'B' quality land produce wheat, which will be sold in the same market at a single uniform price. Now this price will be determined by the cost of production of "B" quality land Thus, 'A' quality land will enjoy a surplus over 'B' quality land.

When the third batch comes it will have three alternatives. If the 'C' quality land yields 60 metric tons of wheat, then rent of 'A' quality land would be 40 metric tons and of 'B' quality land 20 metric tons per hectare. Let us assume that the 4th batch comes it will have four alternatives. If the 'D' quality land yields 40m tons then the rent would be 60, 40 and 20m tons on 'A' 'B' and 'C' quality land respectively as shown in Figure No. 1.

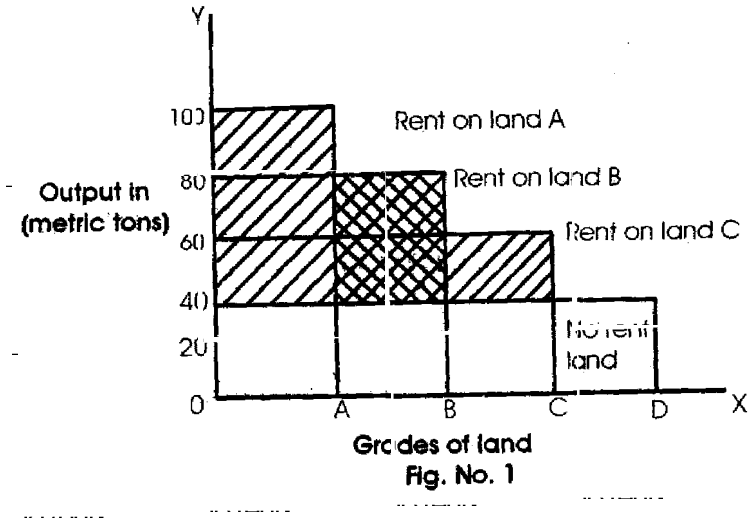


Fig. No. 1

Scarcity Rent

Let us suppose that there is an uninhabited island and some people come to settle there. We suppose that all land in this island is completely homogenous or is of uniform quality. When the people come here, they will use the land for agricultural purpose by applying labour and capital on it. Under this on the same price of land more units of labour and capital are employed to increase production.

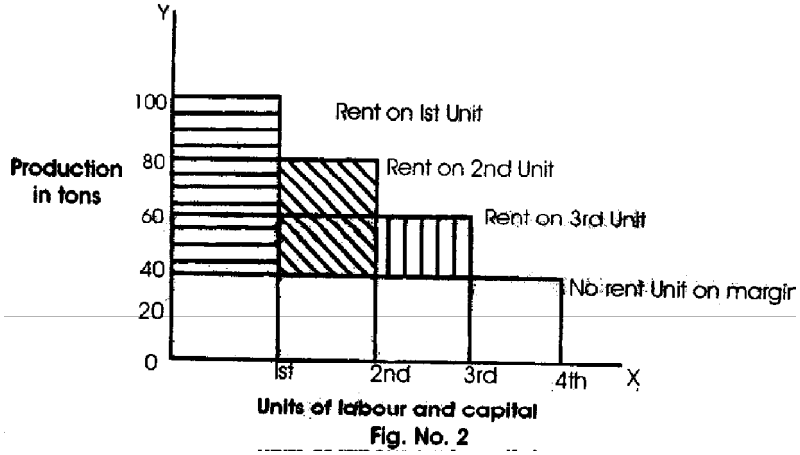


Fig. No. 2

The emergence of land in extensive cultivation has been explained in Figure No. 2. Let us suppose that the first dose of labour and capital yields 100 metric tons of wheat. Let the 2nd dose yields 80 metric tons 3rd dose 60 metric tons and fourth dose produces 40 metric tons. In the diagram 'A', 'B', 'C' and 'D' are the four doses. The rectangle constructed on each of these show the outputs resulting from these doses.

Criticism

No original and indestructible powers :– Fertility of land is not only gifted by God but even through human efforts. By rotation of crops and so many other technical measures, we can increase the fertility of land. Hence Ricardian theory is not a sound theory for explaining the origin of rent.

Historically wrong :– It is pointed out that this order of cultivation from the most fertile to the least fertile is historically wrong. According to Critics, the early settlers occupied the lands nearer the sea-shore and not the most fertile which were lying ahead in the thick forests.

Wrong assumption of perfect competition :– Perfect competition never exists in the real world. Since there is imperfect competition for land, the rent charged by the landowners is more than the economic rent.

Wrong assumption of 'No rent land' :– No land, even the barren pieces of land are not available free of rent. In fact, demand for land is much more than its supply and land has several uses other than farming.

Every land has fertility :– Marginal land was termed as 'No rent land' by Ricardo. In other words, marginal land is without fertility. But it is not correct. According to critics, every land has fertility.

Rent element in all factors :– Ricardo entitled only land to earn rent because he believed that its supply is perfectly inelastic. But according to modern economists, every factor of production has inelastic supply, so every factor can earn rent.

Rent enters into price :– Ricardo concluded that rent does not enter into price. But according to modern economist, rent is part of the cost and enters into price.

It fails to determine rent :– According to Briggs and Jorden, the Ricardian theory simply explains that the rent of an inferior land would be less than of a superior land. But it does not point out why the rent arises.

Wrong idea of application of law of diminishing returns :– According to critics, in the present world with the help of improved technology, production increases at a increasing rate.

Productivity separation is not possible :– According to critics, it is not possible to separate the yield which is due to the original fertility of land and the yield which is due to the investment of capital.

Short Period Ignored

Conclusion :– Despite these criticisms, the Ricardian theory of rent continues to occupy a respectable place in economic literature. The theory has had great influence in the shaping of practical policy in western countries. The

abolition of landlordism in several countries of the world can be directly traced to the influence of the Ricardian theory. The socialists look upon this theory with a feeling of respect on account of its far reaching implications. Ricardo prepared the ground for the coming economists. Even the modern theory of rent is simply a modification or improved version of the Ricardian theory of rent.

QUASI RENT

INTRODUCTION

The concept of quasi-rent was introduced into Economics by Alfred Marshall. Quasi-rent refers to that additional income to a factor other than land which is similar to rent. Rent arises according to Ricardo, on account of the fixed supply of land. But there are other factors also in addition to land which are to be found in fixed supply. The only difference is that while the supply of land is permanently fixed i.e. fixed both in the short run as well as in the long run, the supply of other factors is fixed only in the short period and can be increased in the long period. Thus, in the short period, there is similarity between the supply of land and the supply of other factors, though this similarity disappears in the long period. The additional income earned by these factors in the short period is similar to rent. Hence, Marshall referred to it as quasi-rent.

Definitions :– According to Silverman, "Additional payment of those agents of production the supply of which, though alterable in the long period, is fixed in the short-period, is technically known as quasi-rent."

According to Marshall, "Quasi-rent may be defined as the short run earning of a machine minus the short run cost of keeping it in running order."

Explanation :– Marshall defined quasi-rent as the excess of total revenue over total variable cost. There are two types of factors of production in short run. One is fixed and the other, variable. In the short run, fixed costs are constant. The quantity of the variable factors depends on the size of production. Marshall concluded that the excess earning which factor earns over and above its variable cost in the short run is called quasi-rent. But in the long run, this type of rent is not earned because both fixed as well as variable costs are to be covered.

Quasi-rent = Total revenue - Total variable costs.

Diagrammatical Explanation :

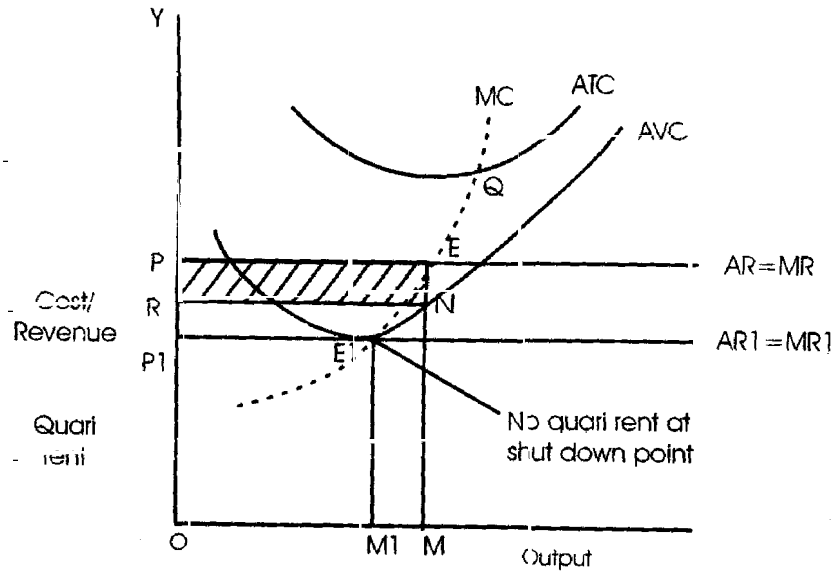


Figure No. 3

In the diagram, the assumption of perfect competition has been taken so that price = AR = MR =OP. When price is OP, the point of equilibrium is E, where MC curve cuts MR from below. OM output is produced. Here AVC is NM. Price is FM. Price–AVC *i.e.* EM–NM=EN is the per unit quasi-rent. The total quasi-rent is shown by the shaded area RNEP. The firm is actually suffering losses because ATC curve lies higher than price level OP.

Suppose that price comes down to the level OP_1. As a result the equilibrium point is E_1 where MC curve cuts MR. This price is covering only the variable costs. Since nothing is earned in excess to the variable costs, no quasi-rent is earned. So as the price comes down to OP_1, the firm will stop producing even in the short run. Hence, OP_1 is the minimum price at which the firm will produce an output or ON_1 It is the shut-down point. There is no quasi-rent here.

We come to the conclusion that quasi-rent is only a short-run surplus. It also vanishes when the price falls to cover only the AVC.

SELF ASSESSMENT EXERCISE

Q. 1. Explain Ricardian theory of rent drawing a distinction between scarcity rent and differential rent.

Q. 2. Does rent in Ricardian theory arise when land is homogeneous and equally well situated? Discuss and illustrate diagrammatically.

Q. 3. Critically examine Ricardian theory of rent.

Q. 4. What do you know about Quasi rent? Why quasi rent cannot exist in the long run?

Q. 5. Distinguish between Quasi rent and Ricardian Rent.

Q. 6. "Marshall's concept of quasi-rent is an extension of the Ricardian rent theory". Do you agree, if yes, explain?

FURTHER READINGS

Modern Micro Economics by H. L. Ahuja

Micro Economic Theory by M. L. Thingan

Economic Theory—Micro Analysis by D. M. Methani

Micro Economics Theory and Applications by D. N. Dwivedi

EC 101

Semester - I **LESSON No. 22**

CLASSICAL THEORY OF INTEREST

OBJECTIVES

After studying this lesson, the student should be able to :–

- Know rate of interest as defined by classicals,
- Learn demand for capital concept and supply of capital concept.
- Determine equilibrium rate of interest and
- Highlight drawbacks of classical theory of rate of interest.

STRUCTURE

22.1 INTRODUCTION

The credit of propounding classical theory of interest goes to Prof. Marshall and Fisher. Pigou, Cassel, Knight and Caussig worked to modify this theory. This theory is also known as the saving investment theory of interest, the demand and supply of capital theory of interest and real theory of interest.

22.2 EXPLANATION

According to this theory rate of interest is determined by the interaction of the forces of demand for and supply of capital. Interest rate is a price for the use and service of capital. Equilibrium between demand for and supply of capital determines interest.

22.2.1 Demand for Capital

Demand for a factor of production is derived. Any factor is demanded for its productivity. People demand capital only for its productivity. A businessman is ready to pay interest on the borrowed money only because the borrowed sum can be utilized somewhere. Marginal productivity of capital determines the demand for capital. It is the addition made to total production by employing one more unit of the capital asset. If marginal productivity of capital is more, demand for capital will also be greater and vice versa. Law of diminishing returns is also applicable to the marginal productivity of capital. When a person borrows money, he has to pay interest on it. Demand for capital is raised upto the point where marginal productivity of capital becomes equal to the rate of interest paid. Thus there is an inverse relation between rate of interest and demand for capital.

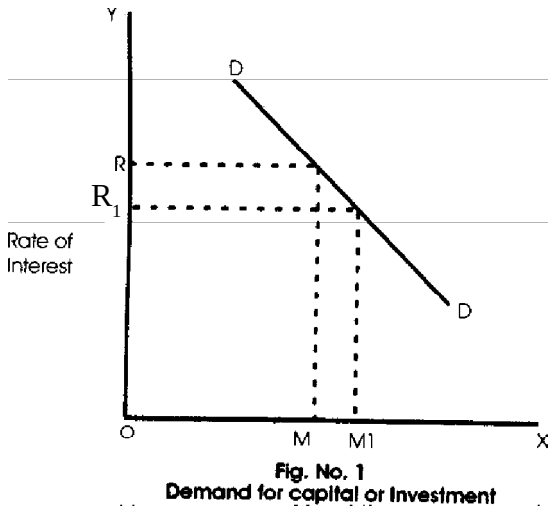


Fig. No. 1
Demand for capital or Investment

In Fig. No. 1 rate of interest on capital demanded OM is OR. Due to the fall in the rate of interest from OR to OR_1, demand for capital increases to OM_1 That is why the demand curve DD slopes downward from left to right.

22.2.2 Supply of Capital

Supply of capital results from savings. Savings is the main source of capital. Level of saving mainly depends on :–

1. **Capacity to save :–** It depends upon the size of national income, size of a person's income, size of family, price level or purchasing power of money, development of trade and industry, transport means and the policies of the govt. If a person's income is more, he can save more. A poor person has little capacity to save. If value of money is more, a small portion of income can meet the needs and the rest of the income can be saved.
2. **Willingness to save :–** Saving varies according to the willingness of the people to save more or save less. It also depends upon nature of the people. Willingness to save is very much affected by rate of interest. On a higher rate of interest, people save more to earn the benefits of high rate of interest. Thus there is a direct relationship between rate of interest and savings.

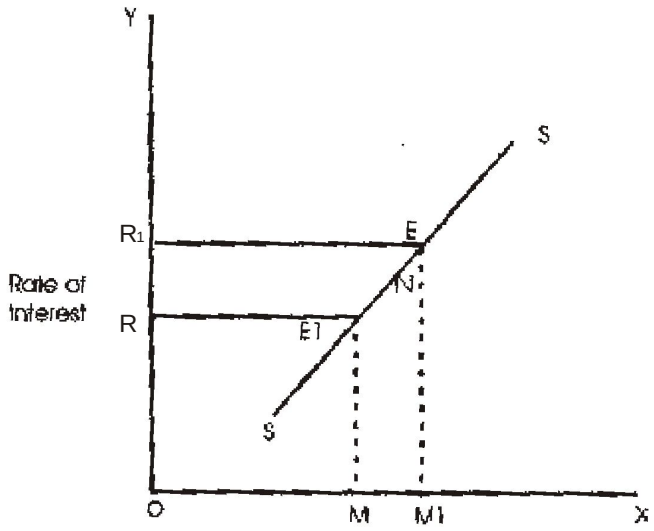


Fig. No. 2

In the Fig. No. 2, at OR rate of interest, OM of money is saved and the supply of capital is also OM. But when interest rate goes up to OR_1, saving of the people

also increase to OM_1. So there is direct relationship between saving and the rate of interest.

22.3 DETERMINATION OF THE EQUILIBRIUM RATE OF INTEREST

Rate of Interest	Demand for Capital on investment	Supply of capital or saving
10	50	90
9	60	80
8	70	70
7	80	60
6	90	50
5	100	40

The table given above shows how rate of interest is determined by the forces of demand and supply of capital. When interest rate is 10%, people demand Rs. 50 crore of capital for investment purposes but 90 crore rupees are available. In other words, people are ready to lend 90 crore rupees. At 10% rate of interest, saving are more than the demand, so rate of interest will fall. At 9% rate of interest, supply of capital is still more than its demand. Now at 8% rate of interest both demand for and supply of capital are Rs. 70 crore. So this is the equilibrium rate of interest. Rate of interest lower than 8% will lead to more demand and less savings. It will increase rate of interest. The rate of interest determined by demand and supply of capital will be called the equilibrium rate of interest because any deviation from it will be an unstable condition of equilibrium.

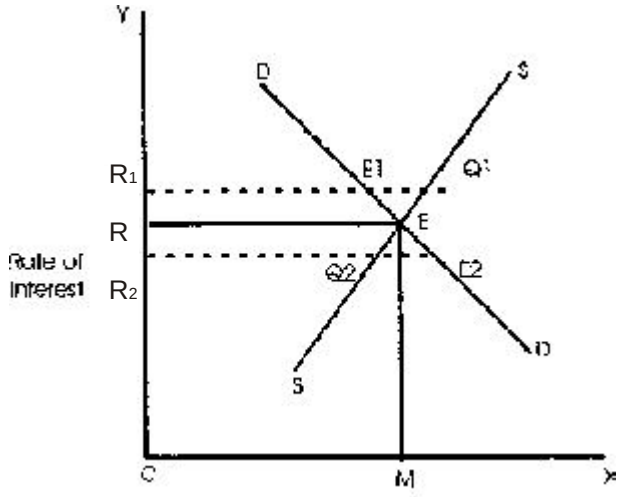


Fig. No. 3

Demand and supply of capital

OR Saving and Investment

In Fig. No. 3, at OR rate of interest, demand as well as supply of capital are OM. So this is an equilibrium rate of interest. If rate of interest becomes higher than OR say R_1 demand for capital is R_1E_1 but supply is R_1Q_1. Supply of capital at OR_1, is more than demand by E_1Q_1. More of supply will lead to the fall in rate of interest till it again levels to OR. Similarly, when rate of interest is fixed lower than OR say OR_2, demand will exceed supply of capital. Excess demand will raise the interest rate to OR. Hence rate of interest is in equilibrium where saving and investment are equal to each other.

22.4 CRITICISM

I. Unrealistic assumption of full employment :– According to Keynes, this theory does not apply to real world. Unemployment or less than full employment is a general sitution. Full employment is only a general case.

II. Short period ignored :– According to Keynes, in long run we are all dead. So a theory based on the assumption of long run is not a practical theory.

III. **Saving and investment equality :–** According to Keynes, saving and investment equality is brought by changes of income and not by interest rates.

IV. **Monetary factors ignored :–** This theory is based on real factors like productivity, saving, sacrifice etc. According to Keynes, this theory ignored monetary factors like rate of interest, So it is not a complete theory.

V. **Indeterminate theory :–** Without knowing level of income we cannot determine interest. But actually level of income is also determined by rate of interest. Rate of interest affects investment which in turn affects income levels.

VI. **Saving is not the only source of capital :–** Saving alone is considered to be the source of supply of capital. But besides savings, supply of capital is also from bank credit and hoarded money.

VII. **It ignores demand for capital for unproductive purpose :–**It assumes that demand for capital is only for productive motives i.e. investment. But actually people take loans for consumption purposes etc.

VIII. **Fixed level of income :–** The theory rests on the belief that level of income remains constant. But actually level of income changes with even a small change in investment. So the theory is not correct.

IX **Saving and investment independent :**

This theory states that saving and investment are independent of each other. But actually when investment changes, income also changes. It leads to change in savings. So investment and saving are not independent of each other. They affect each other.

SELF ASSESSMENT EXERCISE

Q. 1. Discuss classical theory of interest rate determination. Why is this theory said to be indeterminate?

Q. 2. Examine critically the classical theory of interest rate determination.

Q. 3. "Is the rate of interest determined by the demand and supply of money?" If yes, illustrate diagrammatically.

Q. 4. Write down meaning of interest as given by classicals? Explain how Keynes showed that classical theory of interest was indeterminate?

FURTHER READINGS

- Keynes Post Keynesian Economics by R.D. Gupta and A. S. Rana
- Modern Microeconomics Theory and Applications by H. J. Ahuja.
- Principles of Economics by P. N. Chopra

EC 101

Semester - I **LESSON No. 23**

KEYNESIAN THEORY OF INTEREST

OBJECTIVES

After studying this lesson, the student should be able to :-

- Know rate of interest as defined by Keynes;
- Understand meaning of three motives;
- Explain the concept of liquidity concept and supply of money concept;
- Determine equilibrium rate of interest; and
- Show change in rate of interest due to shift in liquidity preference curve.

STRUCTURE

LIQUIDITY PREFERENCE THEORY OF INTEREST

23.1 INTRODUCTION

J. M. Keynes in his book. “The General Theory of Employment, Interest and Money” published in 1936 gave the theory of interest. It is called liquidity preference theory. Keynes criticized classical and non-classical notions of origin of interest. According to Keynes, “Interest is the reward for parting with liquidity for a specified period”. Keynes said that interest is the reward which makes the people ready to part with their cash money. Higher the liquidity preferences, higher will be the rate of interest paid and vice-versa. Thus cash money is called liquidity and the preference of the people for cash money is called ‘liquidity preference.’

23.2 WHY PEOPLE PREFER LIQUIDITY?

PEOPLE PREFER LIQUIDITY BECAUSE THEY HAVE THREE MOTIVES

(a) Transaction Motive

(b) Precautionary Motive

(c) Speculative Motive

23.2.1 (a) Transaction Motive

An individual person has to buy so many things in day to day life. Similarly, firms want to purchase many goods and services daily. For this purpose, people want to keep some cash money with them. This type of demand for liquidity i.e. for carrying day-to-day transactions is called demand for transaction motive. The demand for liquidity from this motive depends upon size of income, time gaps between the receipt of income and spending habits etc.

23.2.2 (b) Precautionary Motive

Future is uncertain, so every man wants to save something or wants to keep some cash money with him to meet unforeseen emergencies, contingencies and accidents. Similarly, businessmen also want to keep cash money with them to safeguard their future. This type of demand for liquidity is called precautionary motive. It depends upon size of income, nature of people and on the far-sightedness of people.

Speculative Motive

People want to keep cash with them to take advantage of the changes in the prices of bonds and securities. Liquidity preference for speculative motive is aimed at securing profit from knowing better than the market what the future will bring forth. People like to hold cash for the purchase of bonds and securities when they think it profitable. It depends upon rate of interest.

The liquidity Trap : Keynes gave the concept of liquidity trap which states that the rate of interest can never fall to either zero or a negative level.

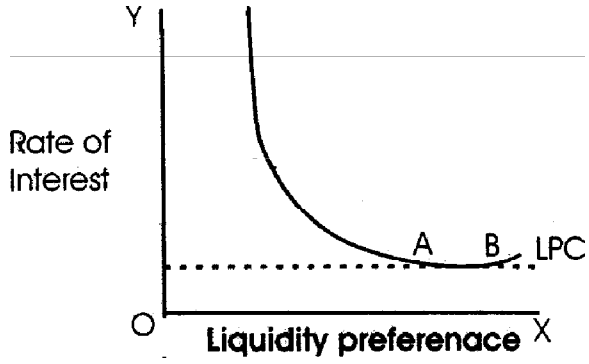


Figure 1

He believed that at a particular low but positive rate of interest, the liquidity preference curve becomes perfectly interest-elastic. The A B portion of the liquidity preference curve in the Figure 1 showing the lowest limit of the interest rate is popularly called liquidity trap.

Determination of the rate of interest : Keynes pointed out that rate of interest is fixed at a point where demand for liquidity is equal to the supply of money.

23.4.1 Demand for Liquidity

The demand for money under different motives constitutes the aggregate demand for money. An increase in the demand for money lead to a rise in the rate of interest and vice-versa.

23.4.2 Supply of Money

Supply of money is quite different from demand for money. Supply of money is controlled by the central bank of a country or its govt. Thus in a short

run, at a particular period of time, supply of money remains constant. The equilibrium rate of interest is determined where m = sm. Where m means demand for money and Sm means supply of money. The rate of interest can be shown through Figure No. 2.

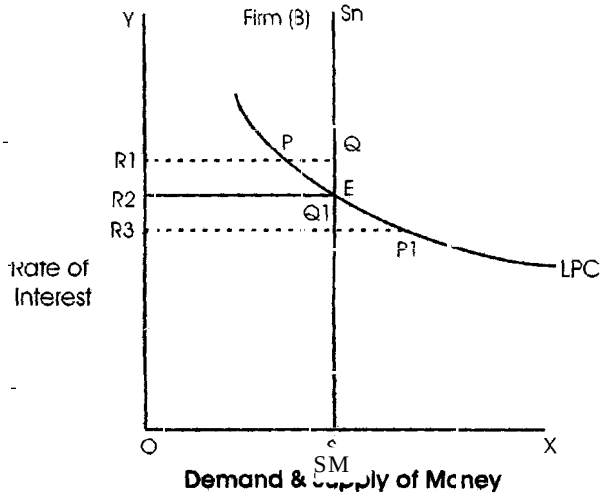
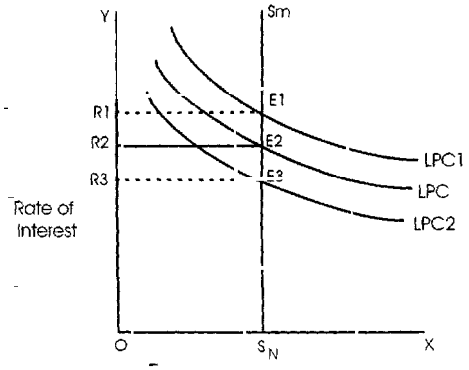


Fig. No. 2

In the Fig. 2, Demand for and supply of money are equal to each other at point E. This gives OR the equilibrium rate of interest. Any deviation from this interest rate will be an unstable rate of interest. At OR_1 rate of interest, demand for money is less than the supply of money by PQ. This will lead to fall in interest rate. At OR_3 rate of interest, demand for money is more than its supply by Q_1P_1. It will lead to rise in interest rate.



Demand and Supply of Money

Fig. No. 3

A shift in LPC also changes rate of interest as shown in Figure No. 3. In the Figure E_2 is the equilibrium point. Any upward shift in demand for money gives a higher LPC demand curve LPC_1. The rate of interest also rises from OR_2 to OR_3. Similarly, a fall in LPC curve to LPC_2 leads to fall in rate of interest to OR_2 when supply of money being constant. So, the rate of interest is changed through the changing interaction of forces of demand for money and supply of money.

Criticism

Real factors ignored :– Prof. Hazlitt and Prof Hanser pointed out that Keynes wrongly considered interest as purely monetary phenomena. This is not a complete theory as it explained the determination of interest without explaining the factors like productivity of capital, saving etc.

No liquidity without saving :– According to critics, there can be no liquidity without saving. Liquidity comes into being only when money is saved. So, interest is a price for saving. Prof Jacob Viner also said that, "without saving there can be no liquidity to surrender".

Indeterminate theory :– Keynes said that demand for money depends upon three motives. The third motive speculative motive depends upon rate of interest. Hence the theory is indeterminate.

Goes contrary to facts :– During depression, people want to have more liquid money with them when rate of interest is very low. Similarly during prosperity people have low liquidity preference but the rate of interest is very high. So the facts go against Keynes theory.

Liquidity arises not from three motives alone :– According to critics, sometimes money is also demanded for deflationary motive, convenience motive, business expansion motive etc. So, the theory is only a practical explanation of the demand for money.

Self contradictory :– Keynes said that interest is a reward for parting with liquidity. A person who deposits his money can withdraw it at any time when he needs it. He also earns interest. So interest can be earned even without parting with liquidity.

Long period ignored : How interest is determined in the long run is not

explained by Keynes in his theory.

It does not explain the differences in rate of interest : This theory has nothing to say about why rates of interest differ from person to person, place to place etc.

23.6 CONCLUSION

From the above criticism, we conclude that Keynes theory of interest has many shortcomings. However, it marked the beginning of a revolution in the field of money, interest and output. It linked the output theory with monetary theory. It also gave a systematic treatment to role of money in determining the rate of interest. So, Keynes theory is surely a better theory than the classical one in the sense that Keynes theory has successfully analysed some fundamental features of money.

SELF ASSESSMENT EXERCISE

Q.1. "Interest is a monetary phenomenon". Discuss in this connection the liquidity theory of interest.

Q.2. What is meant by liquidity preference? How does it explain why interest is paid?

Q.3. Explain Keynes liquidity preference theory of interest as different from the classical theory.

Q.4. What is liquidity trap? Do you agree that higher the liquidity preference higher the rate of interest? If yes, explain diagrammatically.

FURTHER READINGS

Keynes and Post - Keynesian Eeconomics by R. D. Gupta and A. S. Rana

Modern Economic Theory by K. K. Dewett.

Micro Economic Theory and Applications by D. N. Dwivedi.

Economics Theory - Micro Analysis by D. M. Methani.

PROFITS–INNOVATION, RISK AND UNCERTAINTY THEORIES

OBJECTIVES

After going through this lesson you should be able to :–

- Know about profit as defined by Schumpeter, Hawley and Knight.
- Learn about different type of innovations.
- Explain different types of risks.
- Differentiate between insurable or non-insurable risk and
- Understand different types of uncertainties.

STRUCTURE

SCHUMPETER'S INNOVATION THEORY OF PROFIT

24.1 INTRODUCTION

The innovation theory of profit has been given by Joseph Schumpeter, an eminent American Economist. In this theory Schumpeter attributed profits to the introduction of innovations in the production. He observed that the function of an entrepreneur is to introduce innovation with a view to reaping profits from their introduction. According to Schumpeter, profits are the result of innovations. By innovation, Schumpeter meant all those changes in the production process which can reduce the cost of production.

24.2 TYPES OF INNOVATION

Schumpeter pointed out that innovations can be of five types :–

(a) Production of new or different kinds of goods.

(b) Adoption of new techniques of production.

(c) Discovery of new sources of raw materials.

(d) Discovery of new markets for increasing the sale.

(e) Changes in the organization of production.

24.3 EXPLANATION

Schumpeter said that when innovations are introduced into production, the difference between price and cost goes on increasing. It is the cause of the origin of profits. Such profits are not stable. They are temporary. They accrue to the entrepreneur for a short period only. Its reason is that when other entrepreneurs also adopt the same innovation, under competition, profits diminish to zero. Then, again an entrepreneur due to his ability introduces innovations and differences between price and cost start increasing. Profits start coming to the entrepreneur. In this way, Schumpeter believed that profits are temporary. They result from the introduction of innovation by entrepreneurs. They are wiped out due to imitation by the other entrepreneurs. So innovational profits according to Schumpeter appear, disappear and reappear in more or less regular sequence.

24.4 CRITICISM

I. **A narrow theory :–** According to critics, this theory does not provide us with a comprehensive explanations of profits. Innovations, no doubt, cause profits. They are important determinants of profits. But there are several other factors besides innovations which cause profits. This theory says nothing about them. It concentrates only on innovations.

II. **Contrary to facts :–** This theory does not explain that profits are the reward for risk taking. Schumpeter had said, "The entrepreneur is never the risk bearer, the one who gives credit comes to grief if the undertaking fails". According to him, it is the capitalist not the entrepreneur who undertakes risk. This is contrary to facts. It is the entrepreneur, not the capitalist, who takes risks.

III. **Profits is a mixed income :–** The theory takes a very narrow view of the function. The entrepreneur is not only to introduce innovation, he is equally responsible for the proper organization of the business. As such, profit is not mere due to innovations, it is equally due to the organizational work performed by the entrepreneur. Though he does not innovate, yet, every entrepreneur must earn profit if he is to stay in business.

IV. **Temporary Profits :–** The theory has been considered as an unsatisfactory theory because of its explanation of profit as of temporary nature. Profits are neither temporary nor wiped out after short run. In fact, if profits are wiped out soon, no entrepreneur will stick to the production process.

According to critics, this theory does not explain anything about windfall or monopoly profit.

Conclusion :

Schumpeter's innovation theory of profit is subject to criticism by many economists but still this theory points out a very important function of the entrepreneur which generates profits.

HAWLEY'S RISK THEORY OF PROFIT

24.5 INTRODUCTION

Risk theory of profit has been given by Hawley an eminent American economist in 1907, in his book,"Enterprise and Productive Process". According to him, profit is the reward for risk taking in business. Every business involves some risks or the other. For this purpose, he gets profits as an inducement.

24.6 KINDS OF RISKS

According to Hawley, work of the entrepreneur involves many risks. He explained four types of risks which are undertaken by the entrepreneur. They are :–

I. Replacement.

II. Risk Proper.

III. Uncertainty.

IV. Obsolescence.

I. Replacement. Replacement is also called depreciation. It can be calculated as it is added into the costs.

II. Risk Proper. Risk proper is risk of marketability of the product.

III. Uncertainty. Uncertainty is with regard to unforeseen factors.

IV. Obsolescence. Obsolescence is with regard to technical progress. It is not measurable, because it is not always possible to anticipate technical progress.

Entrepreneur bears all these risks in the hope of earning profits. Nobody can stay in production without hoping for profits. So profits may be called 'Cost of staying in business'. Thus, profits is a reward for risk bearing.

24.7 CRITICISMS

I. Risk Avoidance :– According to Prof. Carver, profits occur to the entrepreneur not because he undertakes the risk, but because he avoids the risk, with the use of his business ability. Profit is the reward for risk avoidance rather than risk taking.

II. **No direct relationship :–** The theory considers profit as the reward for risk bearing but, according to critics, there is no direct relationship between profit and risk taking. It is not necessary that if the risk is high, the profit would correspondingly be high. In reality profit is influenced by several factors in addition to risk bearing.

III. **Profit arises not due to all risks :–** Prof. Knight pointed out that profits arise not due to all risks. Some risks can be foreseen. They can be insured so they are covered. Profits occur due to only those risks which are unforeseen, unpredictable and not insurable.

IV. **Profits is a mixed income :–** This theory considers profits as a reward for taking risks. But critics point out that profit is a mixed income. They arise not only due to risk taking but also from the ability, managerial powers and bargaining powers of the entrepreneur.

KNIGHT'S UNCERTAINTY BEARING THEORY OF PROFITS

24.8 INTRODUCTION

This theory was propounded by the American Economist, Prof Knight in his book, 'Risk uncertainty and Profit'. According to Prof. Knight, profit is the reward of uncertainty bearing. Profits accrue to the entrepreneur because he bears uncertainty in business. Prof. Knight has divided risks into two parts in order to clearly differentiate between risk and uncertainty.

24.9 TYPES OF RISK

(a) Insurable or predictable risk :– Prof. Knight pointed out that there are some risks. Such risks can be avoided by insuring them. Such risks are fire, accidents etc. Insurance companies can compensate them at a rate of premium. The premium paid for covering such risks becomes a part of 'cost of production'. So, there is no uncertainty borne by the entrepreneur in such risks.

(b) Non-Insurable or unpredictable risk :– There are some risks which cannot be foreseen. These are changes in fashions, fluctuations in

price level and changes in the customs and habits of the people. Such risks cannot be insured. Professor Knight pointed out that profit is the reward for such unforeseen risks which cannot be insured or avoided. Prof. Knight pointed out that the entrepreneur may have to bear uncertainties of the following kinds.

24.10 KINDS OF UNCERTAINTY

I. **Competitive Uncertainty :–** Some new firms might enter into the industry and the existing firms may have to face serious competition from them. This will lower down the profit of the firm in question.

II. **Technical Uncertainty :–** Some new techniques of production might come into use or some new type of machinery might be evolved. The existing firm may not be in a position to adopt these changes into its organizational set up and may thus, suffer losses in competition with other firms.

III. **Uncertainty of Govt. :– Intervention :** The Govt. might in course of time, intervene into the affairs of the industry by fixing the maximum price of the products and profits of the firm.

IV. **Business cycle uncertainty :–** The advent of business recession or even depression might result in reduced consumer purchasing power and consequently less demand for the product of the firm in question.

Since these uncertainties cannot be foreseen and statistically measured, no insurance company will be prepared to provide cover against them. According to Prof. Knight, there is direct relationship between profit and uncertainty bearing. Greater the uncertainty bearing, the higher the level of profit. Uncertainty-bearing has become so important in business these days that it has begun to be looked upon as a separate factor of production. In other words, the entrepreneur undertakes uncertainty bearing in the expectation of earning a certain level of profit. Thus according to this theory, profit is due not to risk taking, but to uncertainty bearing.

24.11 CRITICISM

I. **Uncertainty bearing is not a separate factor of production :** The critics pointed out that if we consider profit as an inducement to bear uncertainty, it implies that there is a connection between the level of profit and uncertainty bearing. But no such connection exists. If uncertainty bearing is a productive service, marginal productivity theory would apply to it. So there will be no need for a separate theory of profit.

II. **A narrow theory :** Profit is not simply the result of uncertainty bearing. This theory does not give any place to such functions as co-ordination, decision making and supervision.

III. **Not Applicable to joint-stock companies :** The entrepreneur's functions are divided among shareholders, directors, managers of the company. It is not clear in this theory as to who bears uncertainty.

IV. **Not clear on the role of expectations :** The expectations of the entrepreneur play an important role in the choice of his production. There are short-term and long-term expectations. Both these expectations affect profits. Thus, this theory is not clear on the role of expectations.

V. **A micro theory :** The theory does not help us in determining the profit share in macro distribution. It only explains the determination of profits in a micro sense.

Conclusion :

The uncertainty-bearing theory does not furnish a comprehensive explanation of profit and as such, it is inadequate. But it does contain an element of truth in so far as uncertainty bearing is an important determinant of profit.

SELF ASSESSMENT EXERCISE

Q.1. “Profits are a reward for risks and uncertainty bearing”. Discuss.

Q.2. Examine the following statements :

(a) Profits are a reward to the entrepreneur for risk-bearing in business.

(b) Profits are a reward for innovations.

(c) Profits have their origin in uncertainty.

Q.3. Profits are a reward for risk bearing, uncertainty bearing or innovations". Comment.

Q.4. "Profits arise due to innovations and entrepreneurs are rewarded for introducing innovations". Discuss.

Q.5. Profit is the reward for making innovations. Do you consider this as an adequate explanation for profits?

Q.6. Distinguish between risk and uncertainty. What causes uncertainty is an economy? Critically examine the view that entrepreneur is rewarded in the form of profits for bearing uncertainty.

FURTHER READINGS

Modern Microeconomics by H. L. Ahuja

Principles of Economics by M. L. Seth.

Keynes and Post Keynesian Economics by R.D. Gupta and A.S. Rana

Principles of Economics by P. N. Chopra

EC 101

Semester - I **LESSON No. 25**

CONCEPT OF WELFARE ECONOMICS

Objective :-

After studying this lesson, you should be able to:-

- Understand concept of welfare;
- Know that welfare economics is a positive as well as a normative science;

Structure :

25.1 MEANING of welfare.

25.2 Is welfare economics a positive or a normative science.

25.1 Meaning of welfare

Introduction : Welfare Economics is concerned with the evaluation of alternative economic situations from the point of view of the well-being of the society. Suppose that the total welfare in a country is W but given factor endowments and the state of technology, this welfare could be larger i.e W*. The task of welfare economics are:-

(a) to show that in the present state W<W* and

(b) to suggest ways of raising W to W*.

Definitions : According to Prof. Baumol, "Welfare Economics has concerned itself mostly with policy issues which arise out of the allocation of resources with the distribution of inputs among the various commodities and the distribution of commodities among various consumers".

According to Pareto, "any change that makes at least one individual better off without making any other worse off is an improvement in social

welfare".

Now a days, the establishment of a welfare state is the fundamental objective of modern democratic govts. In order to achieve this objective the state attempts to satisfy the wants of each and every individual of the society. Non-satisfaction of wants gives pain to a man and its satisfaction, a pleasure. The word 'pleasure' is associated with welfare.

According to Prof. J.K. Mehta, "if we compare the two periods of time, then a given man has greater welfare in that period in which a larger number of his wants have been satisfied. Conversely, we can say that the smaller the number of wants that remain unsatisfied the greater is the welfare".

25.2 Is welfare economics a positive or a normative science ? : A widely held view on this issue is that Welfare Economics is both a positive and a normative science. Welfare economics is a positive science as it attempts to examine and predict the welfare implications of the functioning of the economic system. "Welfare propositions" may be subjected to test in the same way as those of positive economics, though testing welfare propositions is much more difficult than the propositions of general positive economics. The information gained through positive analysis is useful in devising appropriate policy measures to maximise the welfare of the society.

Welfare Economics is a normative science also as it provides guidelines for policy formulations to maximise social welfare given the welfare function. Welfare Economics, as a normative science, provides guidelines for appropriate policy measures.

Further Readings:

1. Microeconomic theory and applications by : D.N. Dwivedi
2. Modern Microeconomics by : A. Koutroyiannis
3. Advocated Economic theory by : H.L. Ahuja.

EC 101

Semester - I **LESSON No. 26**

PARETO'S CRITERIA; VALUE JUDGEMENT

OBJECTIVES :–

After going through this lesson, you should be able to :–

- Understand the concept of economic efficiency;
- Know the marginal conditions for pareto-efficient situation;
- Illustrate Pareto's criterion using Edge worth box diagram;
- Explain Pareto's criterion with the help of production possibility curve.
- Discuss controversial role of value judgement in Welfare Economics.

STRUCTURE:

THE PARETO-OPTIMALITY CRITERION

26.1 Introduction

This criterion has been given by a famous Italian Economist Vilfredo Pareto (1848 to 1923). According to this criterion, any change that makes at least one individual better off and no one worse off is an improvement in social welfare. Conversely, a change that makes no one better off and at least one person worse off is a decrease in social welfare.

A situation in which it is impossible to make anyone better-off without making someone worse off is said to be pareto-optimal or pareto efficient (often called economic efficiency).

For the attainment of Pareto-efficient situation in an economy, three marginal conditions must be satisfied:-

Efficiency of distribution of commodities among consumers;

Efficiency of the allocation of factors among firms-producers.

Efficiency in the allocation of factors among commodities (Product-mix).

We will assume that it is 2×2×2 model that is two factor, two commodity and two consumer model.

26.1.1 (a) Efficiency of distribution of commodities among consumers:- Let us assume that the society consists of two individuals A and B and there are two commodities X and Y. This condition can be better explained with the help of the Edge worth box diagram no. 1. OA and OB are origins for A and B. A_1, A_2, A_3, A_4 and B_1, B_2, B_3, B_4 are the in-difference curves of consumer A and Consumer B respectively. The edge worth contract curve is formed from the points of tangency of the two consumers' indifference curves. At each point of the contract curve, the following condition is satisfied:-

$$MRS\ A_{x,y} = MRSB_{x,y}$$

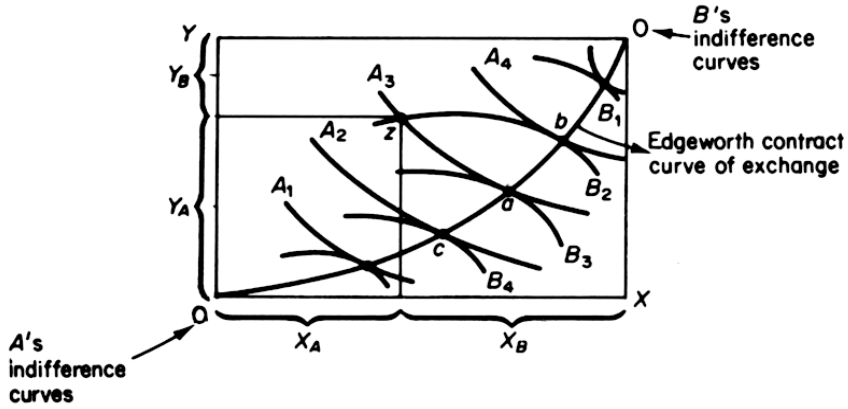


Fig No. 1 Edge worth box of exchange.

The edge worth contract curve satisfies the pareto-optimality condition. Any other distribution off the contract curve is inefficient.

Let us consider Z point where A_3 and of B_2 of individual A and B intersect each other instead of being tangent. Therefore at point 2 $MRS_{x,y}$ of individual A is not equal to that of B. A movement from 'Z' to 'b' increases the satisfaction of A without any decrease in B's satisfaction. Similarly, a movement from 'Z' to 'C' increases B's satisfaction without any decrease in A's satisfaction. The movement from Z to 'a' increases the satisfaction of both because both move to their higher indifference curves. A movement from a point on the contract curve to a point off it results in a decrease in social welfare. The contract curve shows the locus of pareto-optimal or efficient distribution of goods between consumers.

The marginal condition for a Pareto-optimal or efficient distribution of commodities among consumers requires that the MRS between two goods be equal for all consumers.

26.1.2 (b) Efficiency of allocation of factors among firm or producers:-
In the case of allcoation of given resources, K and L we again use the edge worth box of production in fig no. 2.

Only points on the contract curve of production are Pareto-efficient. Point H is inefficient since a reallocation of the given K and L between the producers of X and Y

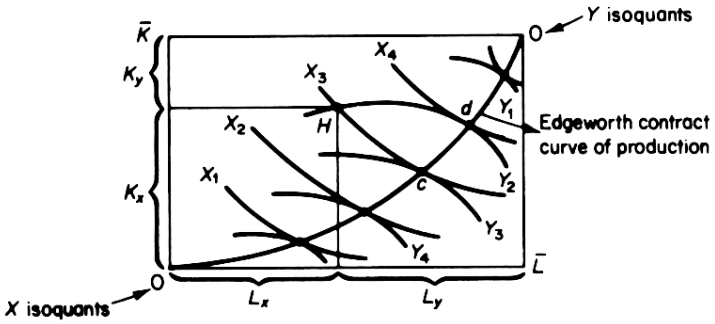


Fig No. 29.2 Edge worth box of production.

So as to reach any point to either c to d results in the increase of at least one commodity without a reduction in the other.

The contract curve is the locus of points of tangency of the isoquants of the two firms which produce X and Y, that is, points where the slopes of the isoquants are equal.

$$\text{Thus } MRS^{x}_{L,K} = MRTS^{y}_{L,K}$$

The marginal condition for a pareto-optimal allocation of factors requires that the MRTS between labour and capital be equal for all commodities produced by different firms.

26.1.3 (c) Efficiency in the composition of output:- The third possible way of increasing social welfare is a change in the product mix. For this we will use production possibility curve. The slope of the PPC is called the 'marginal rate of product transformation ($MRPT_{xy}$) and it shows the amount of Y that must be sacrificed in order to obtain an additional Unit of X.

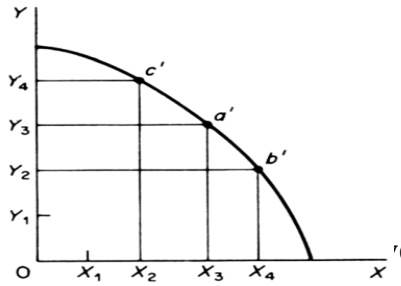


Fig N **'e**

The marginal condition for a Pareto-optimal composition of output requires that the MRPT between any two commodities be equal to the MRS between

the same two goods :

26.4 In Summary : A Pareto-optimal state in an economy can be attained if the following three marginal conditions are fulfilled:-

The $MRTS_{X,Y}$ between any two goods be equal for all consumers

The $MRTS_{K,L}$ between any two inputs be equal in the production of all commodities.

The $MRPT_{x,y}$ be equal to the $MRS_{x,y}$ for any two goods.

A situation may be Pareto-optimal without maximising social welfare. Pareto optimality is a necessary but not sufficeint condition for welfare maximisation. All points on PPC are Pareto-optimal. The choice among these alternatives requires some criterion of social welfare.

26.5 Value Judgement

Meaning:- By value judgement or values is meant the conceptions regarding values of the people about what is good or bad. These conceptions regarding value of the people are not based on any scientific logic or law. There is a great controversy regarding whether value judgements should play any role in Welfare Economics.

Robins and his followers have been asserting that the inclusion of value judgements would make Economics unscientific and according to them, economists should refrain from making value judgements.

On the other hand, majority of modern economists are of the view that economists should not refrain from making value judgements if there is a wide consensus about them among the community.

It should be noted that as far as the welfare of individuals is concerned, though difficult to measure in cardinal terms, economists can measure it in ordinal terms and by observing the act of choice of the individual. For example, if an individual chooses A rather than B, it shows that his welfare is greater in A than in B.

Pareto evolved the concept of social welfare which is said to be free

from any value judgements, because it is not based upon any inter personal comparison of utility. According to Pareto, the social welfare depends upon the welfare of the individuals comprising the society and according to him, if at least one individual is made better off by certain economic reorgainsation and no one being made worse off, the social welfare increases.

SELF ASSESSMENT EXERCISES

Q1. Define economic efficiency. Explain Pareto's three conditions for achievement of economic efficiency.

Q2. State Pareto's Criterion of Social Welfare. Explain Pareto's Criterion of social welfare using Edge worth Box diagram.

Q3. Pareto optimality is necessary but not a sufficient condition for social welfare manimisation. Discuss.

Q4. What is meant by value judgements? Explain their role in welfare economics.

FURTHER READINGS

1. Modern Microeconomics by : A. Koutsoyiannis
2. Microeconomics theory and applications by : D.N. Dwivedi
3. Advanced Economic theory by : H.L. Ahuja.
