ECONOMICS

ANALYTICAL ECONOMICS

Dr. B.R. AMBEDKAR OPEN UNIVERSITY
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COURSE TEAM

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INTRODUCTION TO THE COURSE

The method of Economics is to start with the examination of the functioning of the different units, (people, organisaions of people, workers, capitalists, consumers, firms and so on) which make up the economy and build up a theory of the behaviour of the economy as a whole by aggregating their behavioural patterns. The theory of behaviour assumes that the behaviour of the unit is directed towards some goal which it seeks to realize in the most efficient way. The units differ from one another in respect of goals and constraints stemming from thier very character or situation. For instance, as regards 'goals', individuals or consumers seek the maximization of utility, and firms seek the maximization of profits. Further, the constraints to which they are subject vary. The consumer is limited by his income and the price of the commidities. The firm is limited by technology and the inputs needed to produce a given output, besides the prices at which inputs can be bought and outputs sold. Again the capitalist is constrained by the available rates of return on different types of investment.

This book deals with the topics in 'Analytical Economics' included in the syllabus for the Second Year of Economics of B.A. course offered by the Andhra Pradesh Open University. These topics generally cover the 'core' area of the subject to be studied in the Second Year of the Three Year Degree Course in Economics. The syllabus for the sake of convenience is divided into blocks, each of which comprises a number of units. Each block generally covers a specific area of the subject.

This course on 'Analytical Economics' is covered in eight blocks. The first block deals with the nature, scope and methodology of economics and the second with the theories of consumer behaviour and demand. The third block discusses the theories of production and returns to scale. The fourth covers cost and revenue analyses. The fifth explains the market structure while the sixth introduces the macro economic analysis. The seventh block deals with income determination under consumption and investment functions. The last block examines the relevance of Keynesian concepts to underdeveloped countries.

The units are prepared by specialists and converted into self-instructional material to enable the student to read and understand them without difficulty. Each unit begins with the content, i.e., the aspects to be covered in the unit, followed by aims and objectives of the unit. Subject matter of the unit starts with the introduction and ends with the summary. Check your progress exercises are provided in each unit wherever necessary. Model examination questions and references are given at the end of each unit.

The University hopes that this material will help the student to get acquainted with the principal issues of Analytical Economics which make for its distinctiveness and significance.

CONTENT

BLOCK - I

ECONOMICS - AN INTRODUCTION

This block introduces you the subject matter of Economics. You can understand the basic economic problems a society faces and the scope of economics. Economics is defined in many ways by different economists. You will be dealt with some of the definitions of economics. Basic concepts used in economics can also be learnt in this block. Economics is a science. It has some methodology. This block also deals with different methods followed in economics such as, deductive vs. inductive method, positive vs. normative economics, micro vs. macro economics, partial vs. general equilibrium analyses.

This block contains the following 3 units:

Unit - 1 : Nature and Scope of Economics
Unit - 2 : Economics : Definition and Basic Concepts
Unit - 3 : Methodology of Economics

Unit - 1 : Nature and Scope of Economics

Contents

1.0 Aims and Objectives

The purpose of this unit to is to acquaint you with the subject matter of economics and to explain the scope of the subject.

After reading the unit you will be able to explain

* what is economics,
* the basic economic problems, and
* the difference between economic theory and economic policy.

1.1 Introduction to Economics

The basic question for the beginner is what the subject is and what it is about. If we give him the definition of the subject at the very beginning in technical terms, he will not be able to understand it. So the subject should first be described in simple terms.

It is probably not a surprise that no one can have all that he or she wants of everything. Yet that is the first lesson of economics. Things are scarce, desires are unlimited and it means that choosing has to be done.

1.2 Subject Matter of Economics

Economics teaches us how a person tries to satisfy his unlimited desires with the limited resources at his disposal. In other words, how to use the available scarce resources to meet his unlimited desires. Here the question of choice comes in. The need for choice comes from scarcity.

The discipline of economics studies the problem of scarcity and shows how choices should be made. It helps in understanding what is gained and what is sacrificed each time a choice is made. Because choice is so pervasive, it is not surprising that a great deal of intellectual effort has gone into studying it. The result of this effort is the field of economics. Hence *economics is the study of the allocation of scarce resources among alternative and competing ends.* In less elegant language, economics is the study of how best to use what is available to get what is wanted. Choice is not done in a vacuum. The process of choice is a part of culture and society and hence there are always limits on what can be decided. Most of the personal decisions are made within limits imposed by time, laws and customs. Within these limitations how to use scarce resources to get the greatest amount of satisfaction possible is the domain of economics.

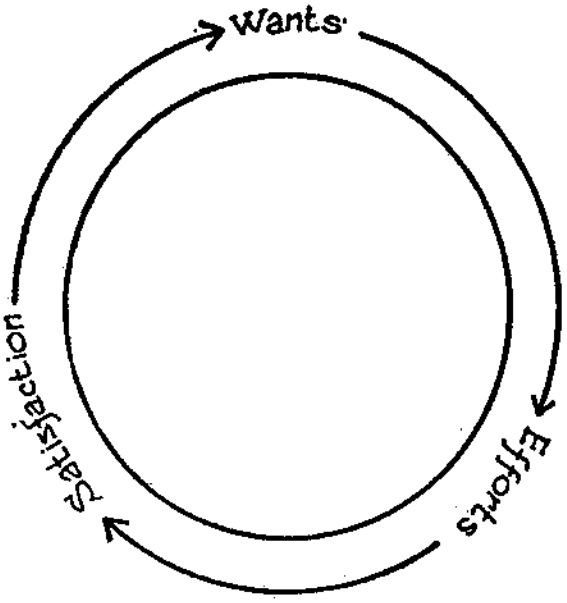
Recent thinking in the subject of economics is that besides studying the behaviour of an individual deriving maximum satisfaction from the use of his limited resources, economics is concerned with the levels of income and employement in a country as well as the causes of their fluctuation. Its study is, thus, intended to promote economic stability. And in respect of underdeveloped economies, it concerns itself with the study of economic growth and development. Thus, *the theory of economic growth and development and the theory of income and employment are recent additions to the study of economics.* It means the subject matter of economics is widening as days pass by. A distinguished economist on being asked to difine the subject matter of his science, once replied, *"economics is what economists do".* There is truth in this, for the boundaries of any branch of study are seldom quite clear and topics which it contains at one time may be excluded at another. Consequently, any short definition of the boundaries of economic analysis is unavoidably inadequate.

We can say that economics studies man's life and work, not the whole of it, but only one aspect of it. It does not study how a person is born, grows and dies. This is the work of another science by name *Biology.* Economics does not study how human body is made up and how it functions. This is the subject of *Physiology.* Econimics does not tell us how a man thinks. It is *Psychology* which studies a man's mind. Economics does not study the organisation of state and its functions. This is the subject of *Political Science.* Economics is concerned with only the economic behaviour of an individual. It means *it tells us how a man uses his limited resources in order to satisfy his unlimited wants to the best possible extent.*

If we look at the society, we see the farmer tilling his field, the labourer working in the factory, the clerk at his desk, the doctor in the hospital, the teacher in the school or college and so on. They are all engaged in economic activities. They earn incomes to satisfy their wants. The purpose behind all the economic activity is the desire to purchase goods to satisfy human wants. Neither goods nor money is an end in itself. But they are needed for the satisfaction of human wants which promotes human welfare.

A person wants food, clothing and shelter. To get these things he must possess money. For getting money, he must work or make an effort. This effort leads to satisfaction. Thus, wants,

efforts, and satisfaction, sum up the subject matter of Economics. It can be shown in the form of a circle.



In the primitive societes, the connection between wants, efforts and satisfaction was close and direct. When a man was hungry, he picked up some fruit or hunted an animal or caught a fish, ate it and was satisfied. But in a modern society things are not so simple. Here a man produces what he does not consume and consumes what he does not produce. The weaver produces cloth but he cannot use it all himself. He sells it in the market for money with which he buys the things which he needs. This work of selling what you do not want and buying what you want is called *'exchange'*. Today the process of exchange comes in between wants, efforts and satisfaction.

Thus, economics, especially neo-classical economics, asserts the existence of a universal economic problem which is unaffected by history in the sense, it is the common feature of every form of society, slave-feudal, capitalist and socialist. In all socieites-according to the above view, means fall short of ends, since wants are assumed unlimited by nature while the means by which they can be satisfied are always limited by definition. Thus, according to the view of radical economics, the neo-classical economics which defines its object of study as the allocation of scarce means to unlimited ends, is inevitably a historical.

Thus, the definition of the economic problem as one of the scarcity turns neo-classical economics into an exclusively quantitative analysis. It directs its attention to such questions as 'How much does a country produce'? What is the level of per capita income? and so on. Perhaps, the father of economics, Adam Smith has given a corect lead to the subject when he defined economics as an inquiry into the nature and causes of wealth of nations. Other classical economists including Marx were intercsted in questions such as those that concern the social relations that they may enter into when they engage in economic activity—relations of master and slave; lord and serf; capitalist and wage labourer—making the subject more relevant to the study of any society. The historical process of the development of a society is of interest to the economists and the industrial revolution beginning with 1760 is a turning point in the study of the subject matter of economics.

1.3 Factors of Production

After the Industrial Revolution, machine-made production came into existence. Now a days, most of the goods are produced in factories. To produce them, the labourer gives his labour, the landlord his land,the capitalist his capital, while the entrepreneur organizes the work of all these factors . Labour, land, capital and entrepreneurship-all these four are termed as *factors of production*. Factors of production are any resources that are used up in the process of producing goods or services. Today some economists prefer to call them inputs. Factors (or inputs) can be as tangible as a piece of coal or as intangible as the thought process of an entrepreneur.

Land: It includes not only surface area, but also water, minerals, coal, soil fertility, air and any other natural endowments associated with the geographical territory. This factor could accurately be called natural resources. *Rent is the return for utilising land.*

Labour: It is a factor that includes a variety of qualities. It refers not only to physical labour but also to skills and talents that differentiate one person from another. Labour includes a worker's ability to execute specialised tasks, to read and to use past experience in performing a job. A physician's practice of his or her profession is labour just as a machine cleaner's efforts are labour. *Labour gets wage as return.*

Capital: Capital is a produced wealth that is used for further production. A factory is capital. It has been produced by those who built it but is not directly consumed. It is a produced means of production which is used to produce other items. Trucks are capital as they contribute to more production. Machines are capital as they are used to make both capital and consumer goods. Office buildings and hydro electric dams are capital. *Capital gets interest as its return.*

Organisation: An organiser or entrepreneur is one who organises, manages, operates and takes the risks associated with a business venture. Entrepreneurship is distinguished from labour because it is a special class of labour that includes the capacity and willingness to take such risks. *The returns to a factor possessing this quality are called profits.* The organiser or the entrepreneur is the one who takes risks by introducing both new ways of making old products and products.

The above factors of production produce goods and services. Goods are tangibles like tables, cars and shoes, etc., and services are intangibles like haircutting and education, etc. Goods and services are not regarded as desirable in themselves. They are needed for the satisfaction of the consumer. The act of making goods and services is called by the economist *'production'*, and the act of using these goods and services to satisfy wants is called *'consumption'*.

Because of the above factors contribute to production, they earn rewards, when the products are sold. Land earns rent, labour receives wages and capital receives interest. The labourer earns wages, the landlord gets rent, the capitalist gets interest while the entrepreneur's reward is profit. Economics studies how these incomes- wages, rent, interest and profits - are determined. This process is called *distribution*. Thus, the subject matter of economics is *consumption* (i.e., the satisfaction of wants). *production* (i.e., producing goods and services or creating utilities or making an effort to satisfy our wants), *exchange* (i.e., money credit and banking, etc.) and *distribution* (i.e., sharing of all that is produced in the country among labourers, landlords, capitalists and entrepreneurs).

One difficulty with above type of understanding of the subject matter of economics is that it treats the three factors - land, labour and capital - as socially equivalent to each other and hence the owners of these factors are rewarded in the form of rent, wages and interest, respectively, according to what they contribute to the value of production. But such a view will exclude any possibility of exploitation, if every one is paid according to his contribution to the value of social product, no matter what form this contribution might take, then no one can gain anything which is not properly his. Thus, this view that the factors are socially equivalent ignores the reality that in a society where possession of private property is allowed, there is bound to be inequalities and the factors may not be socially equivalent.

Thus, the other point of view highlights that in inegalitarion societies surplus value is generated by one factor, that is labour alone and the rentiers and capitalists share this surplus value. Therefore, one should distinguish the production process and the distributive mechanism on the basis whether a society is based on property relations or not.

Check Your Progress -1

1. *Identify the factors of production. What are their returns?*
2. *What are meant by production and consumption?*

1.4 Nature of Economic Inquiry: Economics as a Science

A science is a systematic body of knowledge ascertainable by observation and experiment. It is a body of principles, generalisations, theories or laws which find out a causal relationship between diferent phenomena. In this sense economics is a science. Like all other sciences, in economics , a definite result is expected to follow from a given set of particular causes. But the subject of economics is concerned with the human behaviour which limits experimentation and which is not always certain and even rational. As it deals with the behaviour of people in a society, it is called a social science. The social sciences are those fields of learning concerned primarily with relationships among people and with the institutions people use to guide their behaviour. Sociology, Political Science, Anthropology and Psychology are the other social sciences. As social scientists, economists use the methods of science to gather facts, develop principles, predict behaviour and form policy. In economics, scientific methods starts with a problem. Once the problem is well defined, information that might have an effect on it is gathered. The information is sorted out and analysed and that which is useful is kept to be used as the basis for general principles.

In the social sciences, the principles are often used to help formulate policies. The policies ultimately are aimed at resolving the problem and improving people's lives. Application of scientific method in social sciences can be shown in the following way.

Problem identification → Information gathering → Analysis and generalisation → Policy making

In economics, as in the other social sciences, the pursuit of truth is slow because human behaviour cannot ordinarily be subjected to the kinds of controlled experiments that are possible with white rats and Guinea pigs as in the subject of Zoology. Economics is a non-labouratory science and

therefore controlled experiments are not possible with the economy. For this reason, the laws of economics do not possess universal validity and are not amenable to exact measurement in quantitative terms. According to Alfred Marshall, in sciences, that relate to human behaviour, exactness can hardly be attained. Nevertheless, problems, facts, principles and policies must be considered in a systematic way. Economics tries to make measurements more exact and to enlarge the range of matters. The laws in economics can be compared with the laws of tides rather than with the law of gravitation. As economics is a social science dealing with the behaviour of individuals it is not and can not be as exact as natural sciences.

When a scientific method is applied in economics, the first thing that we should do is to identify the problem. Problems can be divided into macro or micro problems. Macro problems like unemployment, inflation, the balance of payments, the natioal debt, etc., affect the whole economy. Micro problems, like the price of food, are faced by individuals or firms. The economist must use his skill to identify the real problem rather than only a symptom. Once the problem is identified, we should be able to gather the facts about it. Say that the rapid rise and fall of egg prices is making it difficult for consumers to plan their meals. Simply by observing market prices and quantities sold we will not be able to explain how the price of eggs became Rs. 6/- per dozen. A more thorough effort requires inquiry into the price of chickens and chicken feed, transportation costs, egg storage, quality control breakage and several other factors associated with it. Any one can gather these bits of information, but it takes skill to examine them, keep what is relevant and discard what is not. The skills comes from understanding the structures and operation of the economic system.

After a problem is identified and facts have been gathered, generalisations can be made about economic behaviour. These generalisations may be called laws, principles, theories or models. There are rules about behaviour and can be used to describe or predict events. If facts show that when it rains more people will purchase umbrellas, a general rule or principle can then be derived. If it is raining and only one store has umbrellas to sell, that store's business will expand. For example, if only one individual posseses land in the entire village and there are many hands that are in need of work, then wages would be low. An important key to effective generalisations is the ability to simplify the problem. Economic principles or generalisations have one major practical value and that is of predicting the consequences of various economic decisions. Economic policy is based on the principles or the generalisations which we arrive at a problem. But making economic policy work is not easy. Even though principles or models may be available and reasonably accurate they are seldom perfect. A policy of growth might be thwarted by devastating weather conditions or the outbreak of a war or it may be thwarted by lack of proper coordianation of resources or even by an uneven distribution of income. Even if the policy making is inexact, the process of policy making must go on. Though economics is a science, still it is a very young science as there are many observations in the world, for example the distribution of the national product between wages, profits and the rest, for which there are at the moment no fully satisfactory theoretical explanations. But compared to other social sciences, economics is more exact as most of the economic phenomena are quantifiable. As a recognition of this fact, a Nobel Prize has also been instituted for the outstanding work done in this social science.

Check Your Progress - 2

3. Recognize economics as a science.

1.5 Basic Economic Problems

There are three basic problems called central problems of an economy. Whatever may be the type of economic system, i.e. whether it be a capitalist or a socialist, these problems are common. Economists are interested to find out how decisions on these questions are arrived at in various types of societies.

1.5.1 What goods are being produced and in what quantities?

This question arises out of the scarcity of resources in relation to human wants. It also concerns the allocation of scarce resources among alternative uses. Further, an economy has to decide how much resource-allocation should be made for the production of consumer goods and how much for capital goods. The choice between consumer goods and capital goods involves the choice between the present and the future. If a society decides to produce more capital goods now the production of consumer goods will be cut down. But in future it enables the economy to produce more consumer goods.

1.5.2 By what methods are these goods produced?

This involves the choice of techniques. Once the society has decided what goods and services are to be produced, it must then decide how the selected goods are produced. There are various alternative methods of producing goods and the economy has to choose among them. Broadly, we can divide the techniques of production into two categories, namely, (a) Labour-intensive technique of production; and (b) Capital-intensive technique of production. The choice between different methods would depend upon the factor of supplies, the prices of the factors of production and the goals of the economy.

1.5.3 For whom shall goods be produced?

For whom to produce means how the national product is to be distributed among the members of the society. Economists have asked what governs the division of the national product between various groups such as labourers, capitaists and land owners. The great classical economists, Adam Smith and David Ricardo made significant contributions to the *theory of distribution*. The distribution of national product depends again on the objectives of the economic system.

The above three problems are fundamental and common to all types of economic systems. But different economic systems try to solve them differently. For example, a capitalist society will leave everything to be decided in the market place and all these societies are labelled as market-oriented economies. On the contrary, in a society, everything is taken care of by the government and all these societies are labelled as state-controlled economies. But even the market-oriented economies, where everything is sought to be decided in the market place *laissez-faire* economies have run into trouble often resulting in depression where the economic activity is at the lowest ebb. Hence, we find, now-a-days, even in capitalist societies, state intervention to regulate economic activity, perhaps to a limited extent in comparison with the state intervention in socialist societies.

Check Your Progress - 3

4. Identify the basic economic problems of a society.

1.6 Scope of Economics

Scope means the sphere of study. Economics is a discipline of two general bodies of analysis, namely, economic theory and economic policy.

1.6.1 Economic Theory

Economic theory consists of a set of principles which are useful to analyse and describe the relationship among the more important economic variables. The part of the theory which takes care of consumption, production, distribution and exchange with reference to individual units (consumers, firms, etc.) is referred to as micro economic theory. However, it is also necessary to study the behaviour of groups or an entire economy with respect to consumption, investment and saving, etc. This is studied in macro economic theory. Macro theory also studies how the economy as a whole grows or develops. In the open economic systems, the theory of international trade plays a crucial role in studying the possibility of ways of generating economic surplus from the foreign sector for the growth of the domestic economy. Traditional economic theory deals directly or indirectly with individual units, basic economic functions, i.e., consumption, production, exchange and distribution. Modern economic theories take up these activities in the broader perspective of a macro world economic setting where correlation of world forces affecting these fundamental economic activities are analysed and the implications for different sets of economies are interpreted. In doing so, economic theory cannot be ignorant of the roles played by politics, sociology and soon the approach of our study has got to be, in other words, interdisciplinary and international.

1.6.2 Economic Policy

Economic theory essentially has more useful counterpart–the economic policy. Economic theories will remain as useless intellectual exercises, if they do not suggest any positive policy implications. Thus, the proper scope of economics is not merely to satisfy intellectual curiosity by means of theorising but to formulate useful economic policies. In fact, it is not surprising to observe that every important economist and every major school of economic thought has had important elements of theory of economic policy. The theory of economic policy which is within the juridiction of economics studies the organisation and the structures of economic system as a whole with or without the market mechanism. Economic policy is not directly concerned with explaining the allocation of resources. Philip Klein says, " the evolution of micro economic theory from valuation to allocation can be regarded as an upshot of considering the economy as a system of power". According to Frank Knight the central issue of economic policy is the distribution of power among different economic units. To Schumpeter, "economic policy is politics, such that the state becomes an active variable".

The literature on economic development is replete with the issues of economic policy considerations which have their impact on growth and development. Different schools of economic thought advocated different types of economic policies. For example the classical school, in addition to building a body of economic theory, had also a coherent theory of economic policy. In the scope of economics, the classical writers included not only theories of value and growth but also a theory of capitalism as a theory of the economic order. The classical theory of economic policy also included the roles of market mechanism and of government as a social controlling force. Marxism can be interpreted as a theory of economic policy and also as an example of economic theory (theory of value, theory of capitalist development and so on). Marx's theory of economic policy encompasses his theory of capitalist development and theory of capitalist organisation and so on. Thus, the scope of economics includes both economic theory and economic policy. To be meaningful, economic science must bring within its jurisdiction both economic theory as well as appropriate policy making.

Check Your Progress 4

5. Can economic theory be useful to formulate economic polocy?

1.7 Valuation Vis-A-Vis Allocation

The basic principles of economics are to organise production and distribution. This involves the problems of valuation. Here, by valuation, we mean how to value the goods and services produced in the economy whereas by allocation we mean how to allocate the resources among competing ends. If we look at the historical evolution of economics we observe that it has shifted its emphasis from valuation to allocation. To find out the value of a commodity was considered to be thebasic task of an economic system in the past. The Greeks, the Merchantilists and the Physiocrats discussed the problem of valuation. While some economists placed emphasis on the subjective theory of value, other believed in the objective theory of value. Among the physiocrats, Turgot laid emphasis on utility as the most important factor determining value while Quesnay believed in labour theory of value.

The Classical School believed in labour theory of value. Adam Smith propounded two theories of value: Labour Theory and Cost of Production Theory. To him, the basis of exchange value is the amount of labour involved in the production of a commodity. He also believed that the value of a commodity is its cost of production, but he did not treat this notion comprehensively. According to Ricardo, the exchange value of a commodity depended on two factors–scarcity and the amount of labour required to obtain it. He developed a pure labour cost theory of value. Karl Marx put forward a labour theory of value which stated that the exchange value of a commodity depended on the scoially necessary labour time embodied in its production.

The Austrian School emphasised the subjective theory of value. Karl Menger emphasised on the principle of utility. After the advent of the neoclassical school, Alferd Marshall made it clear that valuation depended on the joint interaction of two forces, demand and supply simultaneously. This idea of valuation has continued for several years as the basic principle to economics and still holds its sway.

Though the Classical and Neo-Classical economists considered valuation as the basic function of the economic system, in course of time, the emphasis shifted from valuation to allocation when it was realised that there was no further possibility of increasing the total quantity of resources. Allocation, thus, became the main focus of economics. According to Jevons, the problem of economics was how to allocate a given set of resources among competing uses so that a given set of desires could be most effectively satisfied. Similarly, the problem of scarcity was explicitly recognised by Menger and Walras. The scarcity concept of economics found its best analytical expression in the work of Lionel Robbins. Before Robbins, though allocation problem was recognised by economists, it was not brought to the fore front . The questions–which goods are to be produced? and in what quantity? pertain to the allocation of resources among alternative uses. A free market or capitalist economy relies on the forces of demand and supply for allocating the resources. The allocation of resources should be optimum, i.e. a situation where it is impossible to generate additional gain by reallocating the resources. The production and distribution should be efficient in the above sense. It means, production is said to be efficient if the productive resources are utilised in such a way that through any reallocation it is impossible to produce more of one type of goods without reducing the output of any other type of goods.

The shifting of emphasis from valuation to allocation has given a mistaken notion that these two are entirely separate activities. But it must be borne in mind that allocation is essentially dependent on valuation. In a similar way, valuation depends on allocation. On the basis of allocation, the stock of different varieties would be determined in the society, and therefore their values. For instance, if a major part of resources is allocated for the production of goods 'X', it will not only increase the production of 'X', but will also decrease the production of goods 'Y'. Hence, the price of 'Y' will go up and that of 'X' will go down.

Thus, this shift from valuation to allocation had ignored the study of ways and means by which an economy can improve its production possibilities. The notion that scarcity of resources imposes certain limitations for choice implies that the society should seek methods to overcome this scarcity. Hence, the pursuit of Adam Smith, where he was interested in the growth of an economy, had been relegated to the background in the interrgnum where allocation issues dominated the subject matter of economics. Only in recent times, there is a shift in the emphasis to economic growth, where it was shown that through technological progress and population growth there are possibilities for overcoming the scarcity problem. The socialist economies have demonstrated that a new set of human relations and a change in economic organisation can provide a solution to the problem of scarcity. Thus, it is now realised once again that valuation is an important economic problem for almost all societies as even socialist societies are also experimenting with shadow prices and other types of valuation.

1.8 Summing Up

This unit has begun with the basic question regarding the subject matter of economics. As resources are scarce, satisfaction of unlimited wants leads to the problem of choice. Economics deals with the problem of scarcity and shows how choices should be made. Economics studies the economic aspect of man's life and work.

Factors of Production - land, labour, capital and enterpreneurship - are used in the process of producing goods or services.

Economics is a science. It is a body of principles, generalisations, theories or laws. But at the same time, it is concerned with the human behaviour. Hence it is called as a social science. The subject matter of economics deals with the basic problems such as what to produce, how to produce, for whom to produce and how much to produce. Economics consists of economic theory and economic policy.

Dr.N. Linga Murthy

1.9 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics

1.10 Model Examination Questions

I. Answer the following questions in about 30 lines each.

1. What are the basic economic problems of an economy?
2. What is the purpose of economic theory? How can it be useful to economic policy?
3. Explain the nature and scope of economics?

II. Answer the following questions in about 15 lines each.

1. What is meant by valuation?
2. What is the difference between valuation and allocation?
3. Explain the factors of production? And what are their returns ?

Unit -2 : Economics : Definition and Basic Concepts

Contents

2.0 Aims and Objectives

The aim of this unit is to explain the meaning of economics, to introduce some of the concepts which one comes across in economics, and to differentiate economics with other social sciences.

After reading the unit, you will be able to

* define economics,
* recognize the meanings of basic concepts in economics, and
* compare economics with other social sciences.

2.1 Definitions of Economics

There are plenty of definitions of economics given by various economists. Some of the definitions given by some well-known economists are discussed here.

2.1.1 Adam Smith's Definition

Adam Smith, the first among the classical economists and the "father of economics" published a book in 1776 by name *'An Inquiry into the Nature and Causes of Wealth of Nations'*. In his book he defined economics as a science of wealth. The other early economists also accepted this definition. But this definition received severe criticism as it exclusively paid its attention only to wealth as if wealth was everything. Attention was not paid to man for whom wealth is really meant. Writers like Carlyle and Ruskin dubbed it as the worship of Mammon (the god of wealth). They also accused it as the science that taught selfishness and meanness and hence called it as the dismal science.

2.1.2 Alfred Marshall's Definition

In his definition, Marshal shifted his emphasis from wealth to welfare. Wealth, according to him, was not the end but only a means to an end, the end being human welfare. His definition is given here:

"Political economy, or economics, is a study of mankind in the ordinary business of life. It examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well being"

As Marshall himself put it, 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. When Marshall said that economics is a science of ordinary business of life, it means that it tells us about a man's way of living, that is how he earns his income and how he spends it. An individual has several aspects of his life, viz, social, religious, political and economic. Economics has no concern with the social, religious and political aspects of human life. It is concerned purely with the economic aspect of human life. It means those actions which relate to wealth i.e., how a man produces his wealth and how he uses it; how wealth is exchanged and distributed among individuals in the society. Economics, according to Marshall, studies human welfare - not the whole of human welfare but only a part of it, namely, economic or material welfare. Thus, the focus of study is shifted from wealth to the welfare of man.

But Marshall's definition was also criticised. Prof. Lionel Robbins has objected to the 'welfare' definition on the ground that it includes within its purview only material welfare. It ignores or excludes non-material welfare of human beings. Further, it is not possible to divide in a clear-cut manner the material and non-material welfare aspects of human beings as is assumed by this definition. The two are so closely mixed up with each other that it is impossible to separate them.

2.1.3 Lionel Robbin's Definition

Prof. Robbins rejected the definition provided by Marshall and others and substituted a definition of his own. In 1932, Robbins published his famous essay entitled *'An Essay on the Nature and Significance of Economic Science'* which broke new ground and completely altered the definition of economics. According to him, 'economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses'.

The above definition lays down three important propositions. They are ends, scarce means

and their alternative applications. Ends here refers to human wants and as we know that our wants are unlimited in number. The satisfaction of one want gives rise to another. Although our wants are unlimited, the means at our disposal to satisfy these wants are scarce or limited. If these means were also unlimited, no economic problem would have arisen. The word 'scarcity' is relative in the sense that the resources are scarce in relation to their demand. These scarce resources or means have alternative uses. Not only are our means scarce but they can be put to a number of uses. This makes them all the more scarce. If a commodity or a service could be put to one or a few uses only, no economic problem would have arisen. After the commodity had been put to that use, the remainder of it shall become a free commodity with little economic significance. But in actual life, we find that a commodity can be put to several alternative uses.

However, Robin's definition is not without its critics. His definition excludes from its purview the problem of economic growth and takes a static view of a dynamic problem. Prof. Samuelson's definition is treated as a dynamic one.

2.1.4 Samuelson's Definition

According to Samuelson, 'economics is the study of how people and society end up choosing, with or without the use of money, to employ scarce productive resources that could have alternative uses-to produce various commodities or distribute them for consumption, now or in the future, among various persons and groups in society. Thus, Samulson's definition presents the problem of choice in a dynamic setting and widens the scope of the subject.

Another explanation of the subject matter of economics consists of the way in which the productive forces should be organised for their unfettered growth. For this unfettered growth of productive forces, the concept of equality in human relations has to be brought in and therefore economics should be concerned with the social relations that men enter into when they engage in economic activity.

There is a good list of definitions as discussed above. Yet the scholars can go on extending it many times more. But it is always difficult to compress into a few lines an exact definition of a subject that will differentiate its boundaries very clearly from other disciplines. Instead of defining subject in a few lines, it is always better to go on discussing its range.

Check Your Progress - 1

1. Define economics.

2.2 Wants

Human being is a bundle of wants. His wants are infinite in number and variety. As civilisation increased, human beings were not satisfied with bare necessities of life. The struggle is continuing for comforts and joys of life. All persons do not have the same wants. They vary from individual to individual and they are also relative to one's social and economic position.

2.2.1 Characteristics of Wants

The following are the chief characteristics of wants:

i) **Human wants are unlimited:** There is no end to human wants. When one want is satisfied,

another takes its place. This never-ending cycle of wants goes on rotating in the human mind.

ii) Any perticular want is satiable: Although wants on the whole are unlimited, it is possible to satisfy a particular want provided one has the means. If a man wants a car, he can have it and be satisfied. If he is hungry, he takes food and the want is satisfied. This can be done only when one has the required purchasing power.

iii) Wants are complementary: Very rarely a single commodity by itself satisfies a want. Usually it calls for something else to help it. If we want to write a letter, we must have a pen as well as ink and paper. The pen alone is not enough. Thus, coffee needs milk, sugur, and coffee powder; shoes need laces and so on. Therefore wants are complementary.

iv) Wants are competitive: As we cannot satisfy all of our wants at a time, there will be competition among them. All of us will have limited amount of money at our disposal whereas we want many things at the same time. We cannot buy all of them. We must, therefore, choose between them by accepting some and rejecting others. Then, there is competition among various things we could buy.

v) Wants are alternative: There are several types of goods for satisfying a particular want. If we are thirsty, we can have water, lemon juice, lassi or any other cool drink in summer. In winter if we want to take something hot, we can have tea, coffee or hot milk etc. Thus, there are several alternatives to satisfy our needs. But the final choice depends on their relative prices and the money at our disposal.

vi) Wants vary with time, place and person: Wants are not always the same and they are not the same with everyone all the time. Different people want different things and the same person wants different things at different times and in different places.

vii) Wants vary in urgency and intensity: All wants of individuals are not equally urgent and they do not possess the same intensity. Some wants are more urgent and important than others. There are generally satisfied first while others are postponed.

2.2.2 Classification of Wants

The goods and services that we require in order to satisfy our wants are generally classified as necessaries, comforts and luxuries. Let us consider them one by one.

a) Necessaries: These are the goods without which human beings cannot exist in this world. They are also called minimum needs of life, namely, food, shelter and clothing.

b) Comforts: After satisfying the necessaries of life, human beings crave for comforts. Human beings are born not only to live but to live well. Comforts make for a fuller life of human beings. For a student, a book is a necessity, a table and a chair are necessaries of efficiency but cushioned chair is a comfort.

c) Luxuries: Human beings never stop with comforts. After, comforts are satisfied, he wants luxuries too. Luxury has been defined as something superfluous, something we could easily do without. Luxury cars, Jewellery, silk clothes, cushioned beds are used in order to increase one's status in the society.

The above classification is only a tentative one and we cannot attach permanent and fixed labels of necessaries, comforts and luxuries to commodities. We cannot say that a car is always a luxury and a shirt is always a necessity. The same thing may be a necessity under one set of conditions and a luxury under others. A car may be a luxury for a villager who goes for cultivation, but for a busy official or doctor in a large city, it is a necessity. Similarly, what may be regarded as a luxury in India may be a necessity in England. Overcoats and electric heaters are luxuries in India but necessities in England. Hence, we may conclude that goods are necessaries, comforts or luxuries according to the climate, country and the people we are considering. They are relative to a person, time and place.

Check Your Progress - 2

2. List the characteristics of wants.

3. Classify the wants.

2.3 Basic Concepts in Economics

2.3.1 Utility

We know that goods and services satisfy human wants. This want satisfying power or quality in goods or services is called utility. It is essentially a subjective or introspective concept. It relates to inner sentiments and emotions of human beings. It has no physical or material existence. It resides in the mind of a consumer. The same commodity may have different degrees of utility to different consumers. Mr. ' A' may enjoy the wearing of a white dress and 'B' may not like the white dress.

There is a difference between utility and usefulness. A thing may possess utility but it may not be useful. For example, liquor is harmful to health, yet it may have a high degree of utility for an alcoholic. Utility is also not synonymous with pleasure. A thing may possess utility but it may not give pleasure when consumed e.g., poison.

The main forms of utility are:

a) Form Utility: By changing the form of an article, we can give it greater utility, e.g., the transformation of a log of wood into pieces of furniture.

b) Place Utility: By transporting a commodity from one place to another, we can add utility. When wood is in the forest it does not possess any utility. But when it is brought to the market, it comes to have much greater utility than it had in the forest.

c) Time Utility: By storing a comodity and selling it at a time of scarcity, we can give greater utility.

2.3.2 Value

There are two kinds of value. They are (a) Value-in-use and (b) Value-in-exchange. When we say that fresh air is very valuable, the term 'value' is used in the sense of usefulness. This is value-in-use. Whether goods are free goods or economic goods, they possess value-in-use. Economists use the term 'value' in the sense of value-in-exchange. Value of a commodity refers to the goods which can be obtained in exchange for it. We cannot exchange fresh air for anything as its

value in the economic sense is zero. A pencil has value because it can be exchanged for something else. The value of a commodity, thus, means the commodities or services that we can get in return for it. It is, in short, its purchasing power in terms of other commodities and services. It is the power of commanding other things in exchange. Only economic goods can have value in the economic sense.

There are *three essential qualifications* for goods before they can have value:

a) They must possess utility,
b) They must scarce, and
c) They must be transferable or marketable.

All the above three qualities are essential together. In the absence of any one of these qualities, goods will have no value at all.

2.3.3 Price

There is a difference between the terms 'value' and 'price'. When value is expressed in terms of money, it is called 'price'. Before the invention of money, goods were exchanged against goods. This system is called *barter*. In those days, the price of a commodity meant the commodities for which it could be exchanged. In otherwords, price and value could be used as synonyms. But in modern times, goods are ordinarily exchanged for money. Since value in economics means value-in-exchange, it must be relative.

2.3.4 Wealth

In the ordinary language by 'wealth', people mean only money. But in economics, money is not the only form of wealth. Anything which has value is welath in economics. In economics, the term 'wealth' is synonymous with economic goods. Economic goods are scarce and command a price in the market.

In order to call anything as wealth, it must possess *three attributes*. They are:
a) It must possess utility,
b) It must be scarce in relation to its demand, and
c) It must be transferable from one person to another.

Documents of property and insurance policies are also wealth. They are valuable because they represent titles to property. Hence, they are sometimes called representative wealth. But free goods like air, water and sunshine are not wealth as they are not scarce. Personal qualities like honesty, skill, ability and intelligence too are not wealth. They are a source of wealth but are not wealth in themselves as they are not transferable.

2.3.5 Wealth and Welfare

These two are closely interrelated. Wealth is the means and welfare is the end. Wealth can be used to make people happier and comfortable. But all welath does not bring welfare. It may actually be harmful as in the case of a bad book, poisonous drugs, wine, tobacco, etc. Though the above goods are part of wealth, they do not promote human welfare. Hence, increase in wealth is a powerful means of promoting human welfare.

Thus, wealth and welfare will not go together under all circumstances. But, on the whole, wealth is a powerful means of promoting human welfare.

Check Your Progress - 3

4. What is utility? What are its main forms?

5. What are the essential qualifications of a commodity to possess value?

6. What is wealth? Differentiate it with welfare.

2.4 Relationship with other Social Sciences

All the sciences are developed by man for the benefit of mankind as a whole. Social sciences mainly focus their attention on man. Economics is one of the social sciences. Hence, it is closely related to other sister social sciences.

2.4.1 Economics and Political Science

Originally Economics was called as political Economy. The relationship between political science and economics is the closest. All political problems have their roots in economic causes. Political institutions in turn affect economic conditions and vice-versa. Dictatorship affects economic conditions in a different manner from democracy. Colonialism for a long time was responsible for the misery and poverty of Indian masses. Therefore, there is a close connection between economics and political science.

2.4.2 Economics and History

History is a record of past events. It means it studies the social, political and economic conditions of people at different periods of time. Hence, economic conditions are a part of history. For understanding the present-day economic problems we need their back-ground history. History is also useful in establishing or verifying economic laws. It does not merely tell us the stories of kings and queens. The closeness between history and economics can be expressed as follows:

Economics without History has no root.

History without Economics has no fruit.

2.4.3 Economics and Ethics

Ethics is concerned with morals. It tells us what is right and what is wrong. Ethical or moral considerations govern all economic activity. An economist cannot say 'right' what is morally wrong. Economists like Robbins, however, think that economics is a pure science and as such it is not concerned with right or wrong. It is said to be neutral with regard to ends.

But economics cannot be dissociated from ethics. Hencce, the Greek thinkers made the subject of economics the handmaid of ethics.

Check Your Progress - 4

7. Explain the relationship between economics and political science.

2.5 Summing Up

In the view of Adam Smith, economics is a science of wealth. According to Marshall, economics studies the economic welfare of human beings. A proper and scientific definition was given by Lionel Robbins. His definition gives importance to unlimited wants , scarce means and alternative uses. Other economists also tried to define economics in their own way. However, it is not proper to provide an exact definition to a growing subject like economics.

No human being can satisfy the unlimited wants which vary with time, place and person. Wants are not-only competitive but also complementary to each other. On the basis of characteristics, wants may be classified as necessaries, comforts and luxuries.

A commodity or service can have utility if it satisfies human wants. Value of a commodity, which is scarce, possesses utility and it is transferable. If we express value in terms of money, we call it as price. Wealth, which is also scarce, possesses utility and it is transferable from one place to another. So, anything which has value is wealth.

In the end we tried to explain the relationship of economics with other social sciences namely, political science, history and ethics.

- Dr.N. Lingamurthy

2.6 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics

2.7 Model Examination Questions

I. Answer the following questions in about 30 lines each.

1. Explain the scope of economics analysing the definitions of it.
2. Explain the characteristics of 'wants' and classify them.

II. Answer the following questions in about 30 lines each.

1. Explain the relationship of economics with political science and history.
2. What is meant by utility? Explain the main forms of utility.

Unit - 3 : Methodology of Economics

Contents

3.0 Aims and Objectives

This unit provides a brief description of various methods and approaches to economic analysis.

After reading the unit, you will be able to compare different methods pertating to economic analysis, such as,

* deductive method with inductive method,
* positive economics with normative economics,
* micro economics with macro economics,
* partial equilibrium analysis with general equilibrium analysis, and
* static analysis with dynamic analysis.

3.1 Introduction

Methodology implies a logical process of discovering the truth . In formulating its principles, every science depends on a particular methodology. Methodology in economics has been a highly controversial issue. Since economics is regarded more or less a science, the writers on economics are keen on following scientific methodology.

3.2 Deductive Vs. Inductive Method

There are mainly two types of methods which an economist can follow :

a) Deductive Method; and

b) Inductive Method

3.2.1 Deductive Method

Deduction means the process of drawing generalisations through a process of reasoning on the basis of some assumptions which are either self evedent or based on observation. It is also known as the analytical, abstract and *'a priori'* method of inquiry for the analysis of economic problems. The classical and neo-classical economists widely used this method . Under this method we proceed from general to particular. It deduces conclusions from certain fundamental assumptions. This method is called hypothetical, because some of the assumptions may not correspond to facts. It is also called ' abstract ' because the problem is simplified removing all irrelevant facts.

The deductive process as used by economists involves a number of steps, e.g., the exploration of the problem , building up of hypothesis, development of hypothesis and verification of theories. The first part of deduction is the exploration of the problem, then the task is to take certain assumptions on the basis of which some definite conclusions can be drawn. For example, consider the law of diminishing marginal utility. The law says that the utility derived by an individual from a commodity goes on diminishing with every successive increment of the units. It is a self-evident truth. From this self-evident truth, we can derive many generalisations as a result of deductive reasoning. The law says that the larger the stock of a commodity, the lower shall be the utility derived from it. The larger the stock of money that a person has, the lower is the utility that he derives from it. In the formulation of hypothesis, imagination and insight work along with the fact of the phenomenon. A *hypothesis* in economics may study the causal relationship among various factors which affect the particular situation, e.g., labour supply is a function of real wage as assumed by classical economists or small farms are more productive than the large farms and like. The next task is to empirically verify the hypothesis. If the predictions of a hypothesis are falsified, the hypothesis will be rejected. However, a fully controlled empiricism is dificult in economics. The next task is verification of the theory. Verification is done on the bais of experience of facts through empiricism by means of statistical studies.

The deductive method has several *advantages* as its use is a very simple affair and it does not require elaborate experimentation. This method results in accuracy and exactness in generalisation as this method invariably makes use of logic and mathematics. At the same time this method suffers from certain *disadvantages*. There are :

1. The generalisations arrived at as a result of deductive reasoning can be true only if the assumptions upon which they are based hold good.

2. If the economists were to confine themselves exclusively to the method of abstraction, there is every danger of their efforts resulting in the production of wasteful intellectual exercises.

3. This method proves particularly dangerous when universal validity is claimed for economic generalisations on the bais fof deductive reasoning.

3.2.2 Inductive Method

It is also known as empirical or historical method. It was strongly advocated and also made use of by economists belonging to the Historical School. This technique is a practical approach to the problems of economic science. It reduces the gulf between theory and practice. It proceeds from the particular to the general. It has two forms : experimentation approach and statistical approach.

i) Experimentation Approach : It has very limited scope in economics. But it is indispensable in the case of physical and natural sciences. As economic phenomena is less exact and random in nature, it does not possess a wide scope. Human beings both individually and socially do not always behave in a particular way and their behaviour is not only influenced by economic factors but also by political, social, psychological, cultural and climatic factors. This, however, does not mean that there is no scope at all for experimentation in economics. It has, but it is only modest. As events will not recur in the same way, the scope for experimentation is less. For example, a war may produce certain economic side effects, but it may not recur in the same way and the economist cannot predict all the issues related to it as a pure scientist does and he may not be able to predict in the same manner as a pure scientist can. It may be carried out in economics to find out the validity of certain laws like the law of diminishing returns, elasticity of demand and supply etc.

ii) Statistical Approach : It has a much larger scope in economic investigations than the method of experimentation. It was this form of induction which was mostly advocated by the German Economists of the Historical School. Therefore, to test the hypothesis or establish a correlation between economic facts, statistical tools may be used. Recently, econometrics has acquired importance for empririically testing economic therories and their assumptions.

Advantages of Inductive Method

1. Economic laws or generalisations which are arrived at by a process of induction from a set of carefully collected facts generally lead to precise and measurable conclusions.

2. Some of the important theoroms whether in the social or physical sciences have been discovered as a result of the use of induction.

3. It emphasises the important fact that any generalisation will have validity only under certain conditions or circumstances. For example *Laissez - faire* principle was good in 19th century in Great Britain.

Limitations of Inductive Method

1. There is a risk of hurried conclusions being drawn from inadequate number of facts.

2. The collection of facts itself may be a difficult job.

3. Induction taken alone would not do the trick unless it is supplemented by a process of deductive reasoning.

There is consensus of opinion for integrating both inductive and deductive methods. Induction and deduction are complementary rather than competitive to each other. Alfred Marshall felt that both of them are needed for scientific thought as the right and left feet are needed for walking.

Check Your Progress -1

1. *What is deductive method?*
2. *What is inductive method?*
3. *Describe the advantages of inductive method.*

3. Positive Vs. Normative Economics

3.3.1 Positive Economics

It is concerned with *things as they are*. It studies as to how the economic system works. Here one is concerned with observing the world as it is. A greater part of economics is of this kind. Positive economics attempts to describe and analyse the existing situation rather than suggesting how to change it. It is based on any ethical considerations. It seeks to explain and predict the economic phenomena. For example we may be interested in increasing the revenue of the State and the production of alcohol may be encouraged. Here the positive economist may not be seriously bothered whether production of intoxicants will be detrimental to the interests of the people or not. He is merely interested in seeking ways and means by which the total revenue of the State can be increased. The theories in positive economics are based on a set of assumptions. It is also called theoretical economics.

3.3.2 Normative Economics

Normative or welfare economics is concerned with *' What ought to be'* rather than with what 'actually is '. It provides economic policies. It is based on our judgements about what is good and what is bad and hence it is mixed up with our philosophical, cultural and religious positions. It is based on our value judgements. In discussing economic problems with our friends, we suggest what the government's economic policy ought to be, how government should act to increase the level of employment; how to change the tax system and so on. However, the subject of welfare economics is concerned with the well being of persons as consumers and producers. A normative economist may plead for prohibition of ethical grounds even though the state may be losing some revenue. The important task of normative economics is to difine an ideal economy, an economy that can give maximum satisfaction to individuals from the available resources.

The distinction between positive and normative economics can be clarified by an example. The question 'what government policies will reduce unemployment ?' and 'what policies will

prevent inflation ?' are positive ones, while the question ought we to be more concerned about unemployment than inflation ? is a normative one.

Check Your Progress -2

4. *What do you learn from positive economics ?*
5. *What is the subject matter of normative economics ?*

3.4 Micro Vs. Macro Economics

An important distinction in economics is between micro and macro economics.

3.4.1 Macro Economics

It looks at what happens in individual units of the economy. It is the study of particular firms, households and commodities. It is concerned with what determines the prices of individual goods. It also considers what determines the incomes of particular factors of production. It attempts to explain the working of the markets for individual commodities and the behaviour of individual consumers and producers. It recognises interdependent relationships both competitive and complementary between micro markets. As small objects get magnified under the microscope, in micro economic theory, we study all the facets of problems like the behaviour of a consumer, equilibrium of a firm, price determination in a single market which are small when compared to whole sale business, population in general, large scale business dealers etc. Hence, it is called micro economic theory.

3.4.2 Macro Economics

Macro economics looks at the economy as a whole. It is concerned with the overall perfomance of the economic system rather than individual parts. It deals with total or aggregates eg, total national income, total employment, output and total investment. It is aggregative economics which studies the interrelations among various aggregates and examines their nature and behaviour, their determination and causes of fluctuations in them . It deals with the economic affairs in general. Instead of studying the prices of individual commodities, it is concerned with the general price level. Similarly the level of employment in the economy, the aggregate consumption, aggregate investment are all macro economic variables. Macro-economic analysis is the off-shoot of the poineering work done by John Maynard Keynes during the Great Depression. It discusses the problems of determination of total national income or total employment of a country and investigates into the causes of their fluctuations.

3.4.3 Interdependence

There is no rigid analytical demarcation between micro and macro economics. Both of them are interdependent and interconnected, for the parts affect the whole and the whole affects the parts. Changes in the macro economic variables ultimately affect the micro economic variables. Thus, changes in individual output, income and employment lead to similar changes in national output, income and employment and vice-versa. After all, the whole consists of parts. Hence, a general theory should integrate both the wings of analysis as they are complementary to each other.

Check Your Progress -3

6. *What is meant by micro economics ?*

7. *What is the subject matter of macro economics ?*

3.5 Partial Equilibrium Vs. General Equilibrium

The word 'equilibrium ' in economics has ben imported from Physical Sciences. The concept has become so fundamental in economics that sometimes economic analysis is described as equilibrium analysis. The term 'equilibrium' implies a state of balance or state of rest. In economics, equilibrium does not necessarily mean absence of movement. In fact, the economic system would collapse if all movements in it come to stand still. An economic unit might be moving but at the same time it might still remain in a state of equilibrium. The idea is that there should be no change in the rate of movement. For example, in an economic system, a certain quantity of goods are produced and consumed. This itself indicates movement. But what is important for us is that the rates of production and consumption should not change. As long as the rates of production and consumption remain constant, it can be said that the system is in equilibrium. A consumer will be in equilibrium when he derives maximum satisfaction from a given income spent on different goods and services. Once he reaches the equilibrium position, he sticks to it because any change in the allocation of income to different goods and services will reduce his total satisfaction. Likewise, a firm is in equilibrium when it maximises its profits. The firm will not have the idea to move away from this equilibrium position as profits are maximised at this position. Similarly an industry will be in equilibrium when there is no tendency for the size of the industry to change.

The two types of equilibrium approaches in economics are :

(i) Partial equilibrium, and
(ii) General equilibrium.

3.5.1 Partial Equilibrium

Alfred Marshall has popularised this analysis. In this analysis we isolate a particular type of activity for special investigation, separate from other types, eventhough there is interdependence among the various types of activities. Thus, under partial analysis we investigate in great depth, for example, the behaviour of the consumer, the producer, the factor of production or the monopoly market. In each case we assume that everything else is constant, only one segment of the total market is allowed to change. For example, when we are discussing the relationship between price and quantity demanded of a commodity, we asume that the prices of substitute commodities, incomes and tastes of consumers are constant. For example, in production function analysis, where total product depends on labour and capital when we consider an increase in production, the capital stock is held constant and labour is allowed to vary. The reason for assuming all other things remaining constant is that if we do not assume like that, the analysis of the problem would become an exceedingly difficult affair. But this analysis is criticised on the ground that it concerns only with one or two variables and hence it is narrow and unrealistic.

3.5.2 General Equilibrium

Leon walras of the Laussane School is the expert on general equilibrium analysis. General equilibrium analysis deals with the whole system. It is concerned with the ultimate determinates of the whole system of prices and outputs of all the goods and services produced in an economy.

The general equilbrium analysis proves that when one economic variable changes, others also change simultaneously. For example, the price of butter is increased. Partial equilibrium analysis tells us that reduced quantity of butter will be bought and there the matter ends. But when other factors that influence the demand for butter are also taken into account, the above result may or may not follow. The quantity demanded of margarine, which is a substitute for butter , will rise and consequently its price will also rise. The quantity demaded of the complementary goods such as bread and Jam will decrease and consequently their prices will fall. If less is spent on bread and butter, more may be spent on clothes. If the cloth producer obeys the law of decreasing cost, its price may fall resulting in increased demand for cloth. These changes in the consumer goods sector of the economy wil cause factor shifts causing consequent changes in producers ' sector. Labour and capital will be withdrawn from bread and buter making industries while more capital and labour will be employed in the cotton textile industry. Consequently, the increased demand for cotton will change the land use from food grains cultivation to cotton. All this will change the factor incomes and their demand. Consequently, there will take place further changes in the demand for consumer goods and their prices and so on. In this way, general equilibrium presents an overall framework of basic price, output interrelationships for the entire economy including both commodities and factors of production. Taking the interdependence between all the prices, these can be determined mathematically in a market economy.

Thus , general equilibrium analysis enables us to see the picture of the entire economy while partial analysis presents only one part of the picture.

Check Your Progress -4

8. *What do you learn from partial equiliblium analysis ?*

9. *Describe the analysis of general equilibrium and compare it with partial equiliblium.*

3.6 Static Vs. Dynamic Analysis

It is Auguste Comte, a famous French Sociologist, who introduced for the first time the concepts of 'statics' and 'dynamics' in the domain of social sciences. The credit for introducing these terms in economics goes to John Stuart Mill. The meaning of these two terms in economics is different from physical sciences.

3.61 Economic Statics

The term 'static ' in physical sciences is indicative of a position of rest, or absence of any movement. In economics, however the term 'static' does not indicate a motionless economy. There is movement in the economy but this movement is constant, regular, smooth and certain and it is without any sudden jerks. By static relationship we mean a relationship between certain variables which relate to the same point of time and hence this analysis excludes time. 'Static' in economics is not a state of idleness, but one where work proceeds smoothly at a steady pace day by day and year after year in the economy. According to Harrod, static analysis is concerned with a state of rest which, of course, does not signify a state of idleness, but simply lack of net investment with the result that the economy just reproduces overtime. According to Clark , it is a state where five kinds of changes are conspicuous by their absence ; the supply of capital, method of production, size of population, wants of people and forms of business organisation. Static state is active but it is an

unchanging process. It is like a train coming to a halt at a railway station and remaining in that stationary position. The study of the system in this stationary position is the subject matter of statics. Chamberlin's monopolistic competition and John Robinson's imperfect competition are exercises in static analysis.

The theory of product pricing is a good example of static analysis. Here, we say that the price of a commodity to be determined at a particular point of time by the forces of supply and demand existing at that point of time only. The moment we introduce time element, it ceases to be a static analysis.

3.6.2 Economic Dynamics

Economic dynamics is completely different from economic statics. It studies economic change over time. According to Harrod, economic dynamics refers to a state where the rates of output are changing. Hicks defines economic dynamics as that part of economic theory in which every quantity must be dated. But Harrod does not agree with Hicks when he says that in dynamics dating is no more necessary. But it is the essence of dynamics that economic variables at different points of time are functionally related. There are times when the change of one variable works on another variable. Again, certain variables depend on the rate of growth of other variables. According to Ragnar Frisch, the essential characteristic of a dynammic theory is that we have to consider not only a set of magnitudes of a given point of time and also the study of the interrelations between them but we also consider the magnitude of certain variables at different points of time. According to Baumol, the essence of economic dynamics is prediction i.e., relating an event to the events and incidents preceeding it. In short it is the study of the economic system in action. There is another word used by economists which is called as *comparative statics* which refers to the study of economic system at two reference points. For example, there may be unemployment and still the system may be in equilibrium . If this system may move to a position of full employment and the system in the state of full employment is the subject matter of comparative statics.

3.6.3 Distinction Between Statics and Dynamics

1. Statics is the study of relations between economic variables at a point of time; whereas economic dynamics studies the relationship between variables over time.

2. In statics, there is movement but no change of economic phenomena, but in dynamics the fundamental elements change.

3. Statics studies the movement around the point of equilibrium, but dynamics traces the path from one point of equilibrium to another.

Both static and dynamic analyses are needed in economic science. There are certain economic problems which can only be tackled with the help of dynamic analysis while many other problems may be better managed by the relatively simple tools of static analysis.

3.7 Summing Up

You have learnt in the earlier units that economics is a science. Every science follows its own methodology. Economics has a methodology which is somewhat controversial. Deductive method was followed by classical and neo-classicals. Under this method, conclusions are drawn on the basis of some assumptions which are either self-evident or based on observation. On the other hand,

inductive method, which was used by the economists belonging to the Historical School, proceeds from the particular to the general. In this method, statistical approach has wider scope than the experimentation approach.

Positive economics studies the working of the existing economic system. It is concerned with 'what actually is ', where as, 'what ought to be' is dealt by normative economics. It is based on value judgement.

Economists have divided economic analysis into two branches. Micro economics is concerned with the elements of economic activity - the firm and the consumer. In other words, it takes particular individuals, households, firms, industries or prices of different commodities as the unit of study. On the other hand, macro economics studies the economy as a whole . It deals with the great aggregates and averages of the system - such as national income, total consumption, total savings , total employmen t- rather than with particular parts of it.

Partial equilibrium analysis deals with the relationship between two factors. The analysis is based on *ceteris paribus* assumption which means that all other things being held constant. Where as, general equilibrium analysis deals with the whole system. It deals with the ultimate determinants of the whole system of prices and produce.

Static economists deals with the situation at any given point of time , while dynamic economics is concerned with a period of time.

- Dr. N. Lingamurthy

3.8 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics / Principles of Economics

3.9 Model Examination Questions

I. Answer the following questions in about 30 lines each.

1. Distinguish between deductive method and inductive method.
2. Explain the relationship between micro economics and macro economics.
3. Is partial equilibrium analysis a superior method over the general equilibrium analysis? Explain.

II. Answer the following questions in about 15 lines each.

1. What is positive economics ?
2. What is meant by normative economics ?
3. Distinguish between economic statics and economic dynamics.
4. Explain the two approaches in inductive method.
5. What are the advantages and disadvantages of deductive method ?

BLOCK - II

THEORY OF CONSUMER BEHAVIOUR

From this block we start learning the subject of Micro Economic Theory. In this block we deal with the theory of consumer behaviour. You will be knowing that 'Utility Analysis', contains two major approaches, viz. Cardinal and Ordinal. In Cardinal utility analysis, we critically analyse the law of diminishing marginal utility, the law of equi-marginal utility and the theory of consumers' surplus. In Ordinal utility analysis we discuss the analysis of indifference curve. Other laws like revealed preference theory, slutsky analysis are not explained in this book. Theory of demand, Kinds of demand and elasticity of demand are discussed in the last two units of this block.

This block consists of the following 4 units :

Unit - 4 : Utility Analysis
Unit - 5 : Indifference Curve Analysis
Unit - 6 : Theory of Demand
Unit - 7 : Elasticity of Demand.

Unit - 4 : Utility Analysis

Contents

4.0 Aims and Objectives

This unit discusses the approaches to utility analysis and examines the 'law of diminishing marginal utility ', 'law of equi-marginal utility ', and the concept of 'consumers' surplus'.

After reading the unit, you will be able to

* differentiate between cardinal and ordinal approaches to utility analysis,
* to recall the law of diminishing marginal utility and its limitations,
* to acquire the knowledge on law of equi-marginal utility, and
* to identify the concept of consumers' surplus.

4.1 Introduction

Consumers satisfy their wants through the consumption of goods and services. Goods are difined as things that have the ability to satisfy a need. Economists call the want satisfying property of goods as *'utility'*. In fact, when a consumer buys goods it is not the goods that are desired but the utility that he derives from the goods. Goods are demanded by consumers for their ability to satisfy wants. However, the want-satisfying power or utility is not inherent in goods. Goods posses utility because it is imputes to them by the consumers. For example, diamonds are like pebbles, but as we attach importance to the possession of this scarce good, they have a very high value in capitalist societies. But water, which is esential to life and, therefore, to be considered of very great utility, commands only a very low and often no more than zero price. For that reason a particular type of goods will have more utility for some people than it will have for others. Further more, for a given individual , a particular type of goods will have differing amounts of utility, depending upon the amount consumed . For example when an individual is hungry, he will be inclined to consume food which has a high utility for him at that time. But when he is asked to consume again, he may not be consuming the same quantity and the utility will be also low. Thus, utility of particular good will vary as the quantity consumed varies. Therefore, in a technical sense, each unit of a particular good will be distinct from each other unit.

The consumer is assumed to be rational. Given his income and the market prices of various commodities, he plans the spending of his income so as to attain the highest possible satisfaction or utility to him. This is the axiom of utility maximisation. In the theory of consumption, it is assumed that the consumer has full knowledge of all the information relevant to his decision, that is he has complete knowledge of all the available commodities, their prices and his income.

4.2 Approaches to Utility Analysis

There are two basic approaches to the problem of comparison of utilities. They are ; (1) Cardinalist approach, and (2) Ordinalist approach.

The cardinalist approach assumes that utility can be measured. Some economists suggested that utility can be measured in monetary units, i.e., by the amount of money the consumer is willing to sacrifice for another unit of a commodity. Others suggested that utility can be measured in subjective units called **'Utils'**. This approach is advocated by Gossen (1854), Jevons (1871) and Walras (1874) and Alfred Marshall (1890).

On the other hand the ordinal school maintained that utility is not measurable but it is only comparable. The consumer need not know in specific units the utility of various baskets of goods according to the satisfaction each basket gives him. The consumer would be able to determine his order of preference among the different baskets of goods. Hicks and R.J.D. Allen are the main supporters of the ordinal school. The main ordinal theroies are the indifference curve approach and the revealed preference approach.

Check Your Progress-1

1. *What is meant by cardinal approach to utility ?*

2. *What does the term ordinal approach to utility meant ?*

4.3 The Cardinal Utility Theory

4.3.1 Assumptions

The following are the asumptions behind the cardinal utility approach.

a) Rationality : The consumer is rational . It means he aims at the maximisation of his utility subject to the constraint imposed by his income.

b) Utility is Measurable : The utility of each commodity is measurable. The most convenient measure is money. The utility is measured by the monetary units that the consumer is prepared to pay for another unit of the commodity.

c) Constant Marginal Utility of Money : This assumption is essential if the monetary unit is used as the measure of utility. The essential feature of a standard unit of measurement is that it must be constant.

d) Diminishing Marginal utility : The utility gained from successive unit of a commodity goes on diminishing as the consumer acquires larger quantities of it.

e) The total utility of "a basket of goods" depends on the quantites of the individual commodities. If there are 'n' commodities in the bundle with quantities $x_1, x_2, \ldots\ldots, xn$, the total utility is

$$U = f(x_1, x_2, \ldots\ldots, x_n)$$

4.3.2 Equlibrium of the Consumer

Let us take a single commodity X. The consumer can either buy 'X' or retain his money income 'Y'. Under these conditions, the consumer is in equilibrium when the marginal utility of 'X" is equated to its market Price (Px). Symbolically we have

$MU_x = P_x$.

If the marginal utility of 'X' is greater than its price, the consumer can increase his welfare by purchasing more units of 'X'. Similarly , if the marginal utility of 'X' is less than its price the consumer can increase his total satisfacton by cutting down the quantity of 'X' and keeping more of his income unspent. Hence , he atains the maximisation of his utility when $MU_x = P_x$.

If the marginal utility of 'X' is greater than its price, the consumer can increase his welfare by purchasing more units of 'X'.

Similarly, if the marginal utility of 'X' is less than its price the consumer can increase his total satisfaction by cutting down the quantity of 'X' and keeping more of his income unspent. Therefore, utility can be maximised only when $MU_x = P_x$.

If there are more than one commodity, the condition for the equilibruim of the consumer is the equality of the ratios of the marginal utilities of the individual commodities to their prices. Symbolically,

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots = \frac{MU_n}{P_n}.$$

The utility from spending an additional unit of money must be the same for all commodities. If the consumer derves greater utility on any one commodity, he increases his wefare by spending more on that commodity and less on the other commodities, until the above equilibrium condition is fulfilled.

Check Your Progress - 2

3. *When does the consumer get equilibrium ?*
4. *What are the assumptions of cardinal utility theory ?*

4.4 Law of Diminishing Marginal Utility

This is one of the important laws in consumption theory. Accoring to this law, as a person purchases more and more units of a commodity, its marginal utility declines. In other words, the more we have of a commodity the less we want to have some more of it. It is the practical experience of every consumer that as he goes on consuming a particular commodity, each successive unit gives less and less utility. The law points out that the marginal utility of a commodity depends upon its quantity but is not proportional to its quantity. The marginal utility of the commodity to the consumer depends upon the volume of the stock purchased or possessed already by him. The larger the volume possessed or bought by him, the smaller is the utility derived from an additional unit of the commodity.

Alfred Marshall defined diminishing (marginal) utility as "the additional benefit which a person derives from a given increase of his stock of a thing, diminishes with every increase in the stock that he already has." The above law can be explained with the help of a simple example. The following table relating to an imaginary consumer consuming bananas illustrates the law clearly.

Table - 4.1 : Total and Marginal Utilities (in units)

Number of Bananas	Total Utility	Marginal Utility
1	15	15
2	25	10
3	30	5
4	30	0
5	25	-5
6	15	-10

From table 4.1 it is clear that as the consumer goes on eating bananas, the additional or marginal utility goes on decreasing. The 4th banana gives no additional utility and the 5th and 6th bananas have a negative utility. Their consumption instead of giving satisfaction causes dissatisfaction. If we look at column 2, we will find that the total utility goes on increasing upto a point. It also seems reasonable that the utility of two bananas should be more than that of one and so on. But if we look at that more carefuly we will notice that although the total utility does increase, it increases only at a diminishing rate. In the above table, when the consumer eats the second banana, the increase in utility is 10 units and when he eats the third the total utility increases by 5 only. This can be explained with the help of the following diagram.

4.4.1 Diagrammatic Representation

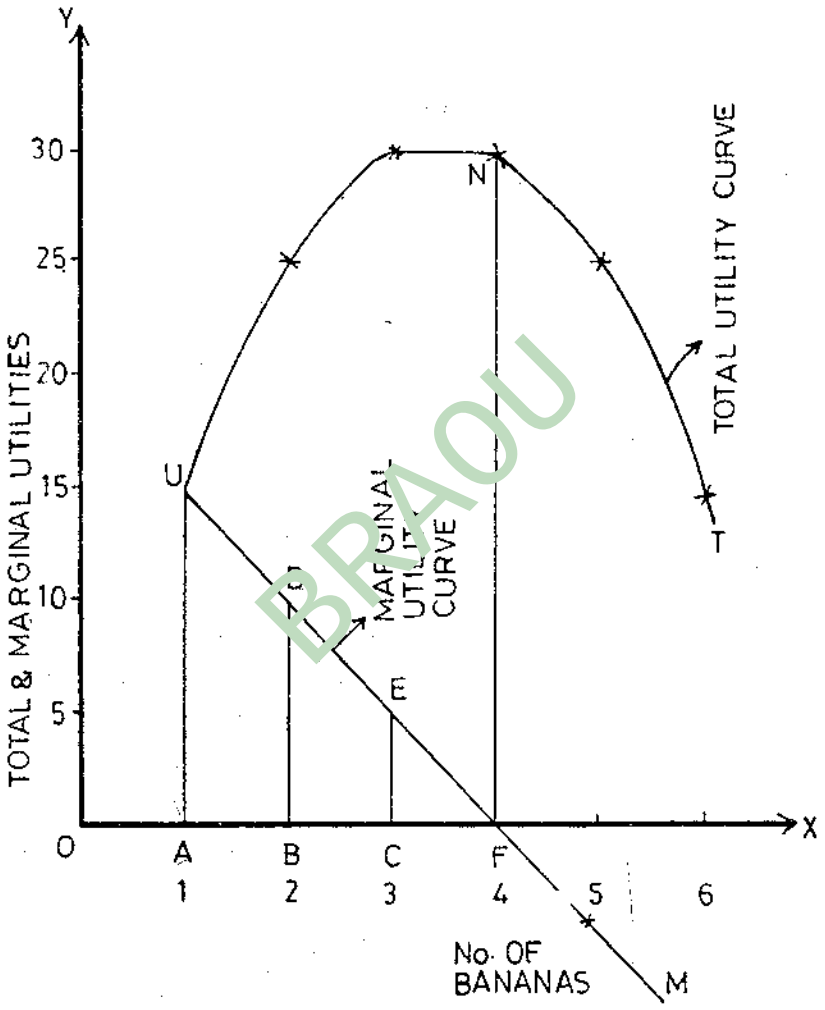


Fig-4.1: Total & Marginal Utility Curves

In diagram 4.1 'OX' axis represents the units of the commodity, i.e., bananas and along 'OY' axis is measured the total and marginal utilities. The total utility curve 'UT', indicates that total utility increases as the comsumption of bananas increases. But the increase is at a decreasing rate. So the marginal utility decreases. At a certain level, increasing consumption of bananas may not push the total utility up. In the diagram at point 'N' the total utility is the highest where the marginal utility is zero. After that the total utility also decreases, and then marginal utility becomes negative.

In the diagram, the marginal utility is represented by 'UM'. The straight lines represent the utility of the various units of the commodity. The 'AU' straight line represents the largest area because the utility of the first unit is the maximum. But the successive straight lines 'BD', 'CE' are smaller in accordance with the operation of the law. At the 4th banana (point F) there is no addition to the total utility, i.e., the marginal utility is zero. And afterwards the marginal utility is negative which is represented below the 'OX' axis. The marginal utility curve 'UM' is sloping downwards to the right because with every increase in the quantity of the commodity consumed, the marginal utility declines.

4.4.2 Assumptions

The law of diminishing marginal utility is based on three important assumptions. They are:

1. The tastes and preferences of the consumer do not change during the period of consumption.
2. The units of the commodity are homogeneous i.e., they are same in size and quality, and
3. There is no time gap between the consumption of the two units of the commodity. In other words, the process of consumption should be continuous without any interval.

4.4.3 Limitations or Exceptions

1. The law does not apply in the case of rare collections like stamps paintings and coins etc. In the case of rare collections, the larger the number he collects, the greater will be the pleasure. Hence, the law does not apply.

2. When we discuss the law, we are applying it only to normal persons. But there are some abnormal persons too e.g., misers, drunkards etc. The more the money a miser has, the greater is the utility that he derives. The more the drunkard gets pleasure the more he drinks.

4.4.4 Importance

The law of diminishing marginal utility expresses us a basic principle of man's behaviour. It is of great practical value to human beings in every walk of life.

1. The law is applied in the sphere of taxation. A rich man is taxed more, for the utility of money to a rich man is less than to a poor man. The principle of progressive taxation is based on this law only.

2. The law can also be applied in determining the prices of goods in the market. An increase in the stock of a commodity brings a person less satisfaction and therefore he can be induced to buy more only if the price is lowered. Hence, the greater the supply, the lower should be the price to clear it and vice-versa.

3. The law regulates our daily expenditure pattern. We know that as we go on buying more of a commodity, its marginal utility falls. Having only a limited amount of money at our disposal, we do not want to waste it unnecessarily on the purchase of the same commodity in large quantity. We, therefore, stop purchasing it at a point where the utility of money spent is equal to the last unit of the good purchased. We spend the rest of our money on other goods.

4. The marginal utility analysis of pricing and the diminishing marginal utility can quickly dispose of the diamond-water paradox with the aid of this analysis we can now explain that the relative scaracity of diamonds results in high price, whiile the relative abundance of water means that its marginal utility and consequently its price will be low despite its high total utility.

Check Your Progress - 3

5. *Define the law of diminishing marginal utility.*
6. *Is the criticism levelled on the law of diminishing marginal utility logical ?*
7. *What does the diminishing marginal utility theory say?*
8. *Draw a diminishing marginal utility curve with the help of an imaginary TU and MU schedule.*

4.5 The Law of Equi-Marginal Utility

It is another important law in consumption theory. This is also known as the Law of substitution or the equi-marginal principle. It is also called as the Second Law of Gossen (the law of diminishing marginal utility being Gossen's First Law), an Austrian economist who found it. As human wants are unlimited and the resources to satisfy them are limited, every prudent consumer, therefore, will try to make the best use of the money at his disposal and derive the maximum satisfaction. In the words of Alfred Marshall if a person has a thing which can be put to several uses, he will distributed it among these uses in such a way that it has the same marginal utility, for if it had a greater marginal utility in one use than in another, he would gain by taking away some of it from the second use and applying it to the first.

For getting maximum satisfaction out of the money at our disposal. We carefully go on weighing the satisfaction obtained from each rupee that we spend. If we find that a rupee spent on one commodity had greater utility than in another, we shall go on spending rupees on the former commodities till the utilities derived from the last rupee spend in the two cases are euqal. It means, we substitute some units of a commodity of greater utility for some units of lesser utility. As a result of this substitution the marginal utility of the former will fall and that of the latter will rise till the two marginal utilities are equalised. Hence, this is called the law of Substitution. The following imaginary schedule will provide us the marginal utilities of two commodities i.e., 'X' and 'Y' .

Table - 4.2: Marginal Utilities of Commodities 'X' and 'Y'

(in units)

Money units	Marginal Utility of 'X'	Marginal Utility of 'Y'
1st rupee	10	8
2nd rupee	8	6
3rd rupee	6	4
4th rupee	4	2
5th rupee	2	0
6th rupee	0	-2
7th rupee	-2	-4

In the above table, we are assuming that the consumer has Rs. 7 at his disposal to spend on two commodities 'X' and 'Y'. The two utility schedules indicate that the consumer's preference for

commodity 'X' is more marked since he seems to receive more utility from his consumption of "X' than from 'Y'. If he spends his whole income of Rs.7 on commodity 'X' alone, he will secure a total satisfaction equivalent to 28 units while if he spends his entire income on 'Y' alone, he will secure only 14 units of utility. But the consumer will not, however, spend his entire money income on one commodity alone. The normal consumer behaviour pattern shows that people do not specialise in consumption. On the basic assumption that he wants to get maximum satisfaction, the consumer will continue to distribute his limited income on both goods till the marginal utilities, a rupee worth of purchase of the two goods, are equal. From the above utility schedules, we can say that the maximum satisfaction will be attained if the consumer spends Rs.4 on 'X' and Rs.3 on 'Y'. The maximum satisfaction will be about 46. In no other case does this utility amount to this. Now the marginal utility of both commodities 'X' and 'Y' is same i.e., 4. thus, we can come to the conclusion that we can attain maximum satisfaction when we equalise marginal utilities by substituting the more useful for the less useful commodity.

4.5.1 Diagrammatic Representation

In the two figures given below, we take money units on 'OX' axis and marginal utilities of two goods on 'OY' axis. suppose a consumer has Rs. 7 to spend on 'X' and 'Y' whose diminishing marginal utilities are shown by the two curves 'AP', and 'OR', respectively. The consumer will gain maximum satisfaction if he spends 'OM' money on Y and OM' on X (4 rupees) because in this way the marginal utilities of the two are equal (PM = P'M'). Any other arrangement will give less than total satisfaction. Let the purchaser spend MN money (one rupee) more on X and the same amount of money N'M' (=MN) less on Y. The diagram 4.2 shows a loss of utility represented by the shaded area LN'M'P' and a gain of PMNE utility. As MN = N'M and PM =P'M' it is proved that the

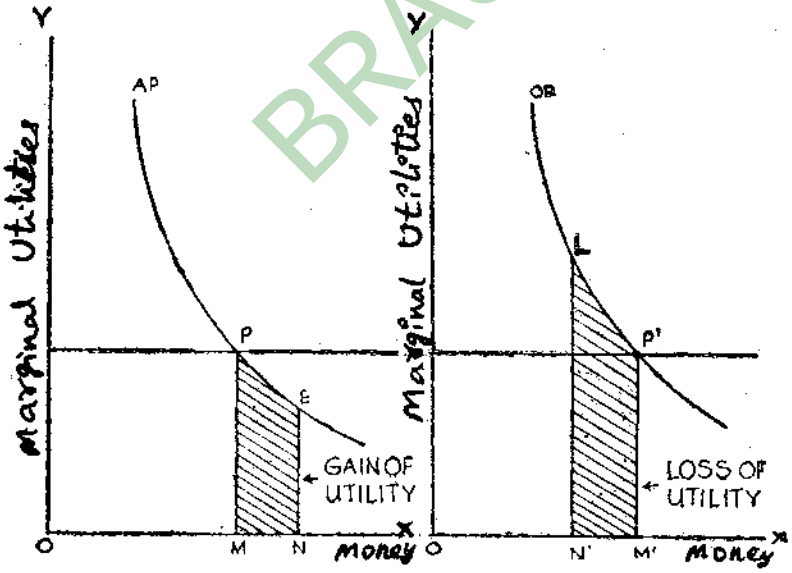


Fig- 4.2: Equi - Marginal Utility

figure LN'M'P' (loss of utility from reduced consumption of oranges) is bigger than PMNE (gain of utility from increased consumption of apples). Hence, the total utility of this combination will give maximum satisfaction.

4.5.2 Limitations

1. The law is based upon the assumption that a man acts in a perfectly rational manner when

Figure-4.3

e spends his money - income on a number of different commodities. If the consumer is ignorant or lindly allows custom or fashion, he will make a wrong use of money. On account of his ignorance e may not know where utility is greater and where less.

2. An incompetent entrepreneur will fail to achieve the best results from the units of land, abour and capital that he employs. This is so because he will not be able to divert expenditure rom less profitable channels to more profitable channels.

3. The land does not apply in cases where the resources are unlimited as for example is the ase with the free gifts of nature. In these cases, there is no need of diverting expenditure from one irection to another.

We had been employing all through our analysis a monetary measure of marginal utility to nake our comparision between the price of a commodity and its marginal utility. The marginal utility of X in money terms was defined as the maximum amount of money which the consumer is willing to pay for an additional unit of X. But the marginal utility theorists were generally dissatisfied with such a measure. For when money becomes scarcer, they maintained, its subjective marginal value will increase, like that of any commodity. Marginal utility must, according to this view, be measured in its own subjective units. We may call them utils. The view can be referred to as the neo-classical cardinal utility position. One index that had been developed in this direction is called N -M utility index, named after the two authors, Neumann and Magenstern who constructed it. The N - M index is cardinal and it is intended to be used for making predictions. It is employed to predict which of two risky alternatives a person will prefer. For example if he has to choose between two lottery tickets, we are given this individual's ranking of the alternative prizes offered by the lottery tickets and the odds on each prize. From this we wish to be able to infer by numerical calculation, and without actually asking the person, which lottery ticket he will choose. Even though, by a numerical N-M utility index we can compute numerical marginal utilities and some of the other measures encountered in neo-clasical utility theory, it is surely not cardinal measurement in the neo-classical sense.

Check Your Progress -4

9. What is the main thrust of the law of equi - marginal utility ?

4.6 The Concept of Consumer's Surplus

The concept of consumers' surplus was introduced in economics by Alfred Marshall, who maintained that it can be measured in monetary units. In our everyday life, we often find that the price we pay for a commodity is usually less than the satisfaction we derive from its consumption. Some times we will be prepared to pay much more for a commodity than we actually pay. Consumers' surplus is "equal to difference between the amount of money that a consumer actually pays to by a certain quantity of a commodity 'X' and the amount that he would be willing to pay for this quantity rather than do without it". In some of the items of our daily expenditure, the idea of consumers' surplus is quite obvious e.g., a packet of salt, a post-card, a newspaper, a match-box etc. They are very useful commodities but at the same time, they are also very cheep. We are, therefore, prepared to pay much more for them, if need be, than we actually have to pay. For their purchase, therefore, we derive a good deal of surplus or extra satisfaction over and above the price that we pay for them - this is consumers' surplus

Consumers' surplus = Total utility - Total amount spent

The following table ilustrates the concept of the consumers' Surplus.

Units (Apples in Dozen)	Marginal Utility	Price (in Rupees)	Consumers' Surplus
1	2	3	4
1	20	5	15
2	18	5	13
3	15	5	10
4	11	5	6
5	5	5	0
Total Units purchased 5	Total utility 69	Total Money Spent 25	44

In the above table, it is assumed that the price of apples in the market is Rs.5 per dozen . The consumer will purchase as many apples as will make his marginal utility equal to the price. Thus, he will. purchase 5 dozens apples and pay for each dozen Rs. 5. Totally, he spends Rs. 25 But his total utility from 5 dozens apples is equal to Rs. 69. He, thus, gets a consumers' surplus equal to Rs. 69 - Rs.25 = Rs 44.

The consumers' surplus can be found out from the fourth column of the table. From the first dozen of apples, the consumer gets utility equal to Rs. 20. Therefore, the consumer would be ready to pay Rs. 20 for it rather than to go without it. But he pays for the first dozen only Rs. 5 because the price of orange in the market is only Rs. 5 . Therefore, from the first dozen, he gets consumers' surplus equal to 20-5 =15. Smalarly, he gets Rs. 13, Rs 10 and Rs. 6 consumers' surpluses on the second, third and fourth units. From the fifth unit the consumer derives utility equal to 5 and he also pays Rs. 5 for it. Thus, there is no consumers ' surplus on the fifth unit. The total consumers' surplus is equal to Rs. 44. We can also represent consumers ' Surplus with the help of a diagram.

4.6.1 Diagrammatic Representation

In the following diagram, the units of the commodity are measured along 'OX' axis and marginal utility in terms of money is measured along 'OY' axis.

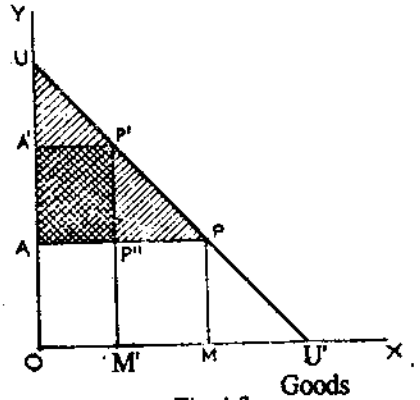


Fig-4.3

Graphically, the coonsumers' surplus is found by this demand curve for commodity X and the current market price which the consumer cannot affect by his purchase. In the diagram, the consumers ' demand curve for 'X' is a straight line UU' and the market price is 'A' . At this price, the consumer buys 'M' units of X and pays an amount AXM for it. However, he would be willling to pay P^1 for M^1, P2 for M2 and for P3 for M3 and so on. The fact that the price in the market is lower than the price he would be willing to pay for the initial units of 'X' implies that his actual expenditure is less than he would be willing to spend to acquire the quantity 'M'. This difference is called the consumers' surplus and it is represented by the area of the 'PUA'.

4.6.2 Criticism

1. It is argued that consumers' surplus is purely an imaginary idea. You just imagine what you are prepared to pay and you proceed to deduct from that what you actually pay. It is all hypothetical.

2. It is difficult to measure consumers' surplus precisely as few people would be ready to say what they would be prepared to pay for a commodity. Besides different people are prepared to pay different amounts.

3. It does not apply to the necessaries of life. In such cases, the surplus is immeasurable. A man would be ready to pay any amount for a glass of water when he is dying of thirst. Further, economists like Hicks and Allen felt that utility is a subjective phenomenon and hence cannot be measured in concrete terms.

But this notion of consumers' surplus is useful to exchequer for the imposition of certain taxes as the consumer will not feel it burdensome if the tax is imposed on a commodity for which he derives consumers, surplus.

Check Your Progress -5

10. What is meant by consumers' surplus ?

4.7 Summing Up

In this unit, we have dealt with one of the two approaches relating to utility analysis, that is, cardinalist approach. This approach assumes measurement of utility in 'utils' . In this analysis, consumer gets equilibrium when the price of a commodity is equal to the additional benefit, i.e., marginal utility, he derives from consuming that commodity. This condition is aplied even if there are more than one commodity.

The important theory in utility analysis is the law of diminishing marginal utility. It means that if you consume more of a commodity, without time lag, the marginal (additional) utility you get from that commodity goes on decreasing. Another theory we have learnt in this unit is the law of equi-marginal utility. In order to maximise our satisfaction with the limited money we have, we weigh the utility dervived from each rupee that we spend. We choose that commodity which gives more satisfaction till the utilities obtained from the last rupee spent in the two are equal. This substitution leads to the equality of marginal utilities.

The other concept we have seen is the consumer's surplus.. It is the excess of what we are prepared to pay over what we actually pay for a commodity.

All the three theories depend on the assumption of measurability of utility. But, in practical world, we cannot measure utility from a commodity we consume. This assumption was criticised by many economists. Even marginal utility of money may not be constant as it may change for person to person.

- Dr. N. Lingamurthy

4.8 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics / Principles of Economics

4.9 Model Examination Questions

I. Answer the following questions in about 30 lines each.

1. Explain the law of diminishing marginal utility with the help of a diagram.
2. Explain the law of equi-marginal utility.
3. Explain diagrammatically the concept of consumer's surplus.

II. Answer the following questions in about 15 lines each.

1. Distinguish between cardinal and ordinal approaches of utility.
2. How do you arrive at consumer's equilibrium in the cardinal utility approach ?
3. What is meant by consumer's surplus ?

Unit - 5 : Indifference Curve Analysis

Contents

5.0 Aims and Objectives

The purpose of this unit is to explain the ordinal utility approach as exemplified by the indifference curve analysis.

After reading the unit, you will be able to recall an important approach of ordinal utility analysis, viz., indifference curve approach. You will also be able to recognise income, substitution and price effects.

5.1 Introduction to Ordinal Utility Approach

In the study of marginal utility analysis, we have assumed that utility is measurable in the cardinal sense. To overcome this difficulty the modern economists have developed an alternative approach of indifference curve analysis based on ordianal measurement of utility. This is in recognition of the fact that exact measurement of utility is not possible and that the economists can at best give a ranking to consumer's satisfaction instead of measuring it in units. The N-M index is also ordinal in its approach even though it seems to be using the cardinal approach. In the ordinal approach, the consumer need not assign specific amounts to the utility which he derives from the consumption of a good or combination of goods. He will simply campare the different utilities or satisfaction in the sense whether one level of satisfaction is euqal to, lower than, or higher than another. For example, if the various combinations are X, Y, Z, etc., the consumer can tell whether he prefers X to Y or Y to Z or is indifferent to the comparing of them. The concept of ordinal utility implies that the consumer cannot go beyond stating his preference or indifference. In other words, if a consumer happens to prefer X to Y he cannot precisely tell by how much he prefers X to Y or he cannot tell the quantitative differences between various levels of satisfaction. At the most he can merely judge whether one level of satisfaction is higher than or lower than or equal to another or alternatively rank his perferences as 1st, 2nd, 3rd and so on. For example, suppose the individual consumer is consuming rice and clothing. The indifference curve analysis indicates that he would be consuming both in such a manner that his level of satisfaction would be the same if he consumes less of rice and more of clothing or more of rice and less of clothing as long as remains on the same indifference curve.

Check Your Progress -1

1. What is ordinal utility analysis?

5.2 What are Indifference Curves

To understand indifference curves, it is better to start with an indiference schedule.

Table-5.1 : Indifference Schedule

Schedule-I		Schedule- II	
Goods 'X'	Goods 'Y'	Goods 'X'	Goods 'Y'
1	15	1	17
2	11	2	14
3	8	3	11
4	6	4	8
5	5	5	6

In the above schedules the consumer has to start with 1 unit of X and 15 units of Y. Now the consumer is asked to tell how much of goods he will be willing to give up for the gain of an additional unit of X so that his level of satisfaction remains the same. If the gain of one unit compensates him fully for the loss of 4 units of Y, then the next combinition of 2 units of X and 11 units of Y(2X+11Y) will give him as much satisfaction as the initial combination (1X+15Y). Similarly by asking the consumer further how much of Y he will be prepared to fore-go for successive

increments in the stock of X so that his level of satisfaction remains unaltered. We get combinations of 3X+8Y, 4X+ 6Y and 5X+5Y each of which provides the same satisfaction as combination 1X+15Y or 2X+11Y. Since satisfaction is the same whichever combination of goods in the schedule is offered to him, the consumer will be indifferent among the combinations included in a schedule. Similarly the consumer may have another schedule representing more of both the goods than the initial combination in Schedule-II. Once again the consumer is indiffeerent among the various combinations in Schedule-II, but however, it should be borne in mind that the consumer will prefer any combination in Schedule-II for any combination in Schedule-I because it is assumed that more of a combination is preferred to less of it and hence any combination in Schedule-II will give him more satisfaction than any combination in Schedule-I.

The indifference schedule can be converted into indifference curve by plotting the various combinations on a graph paper.

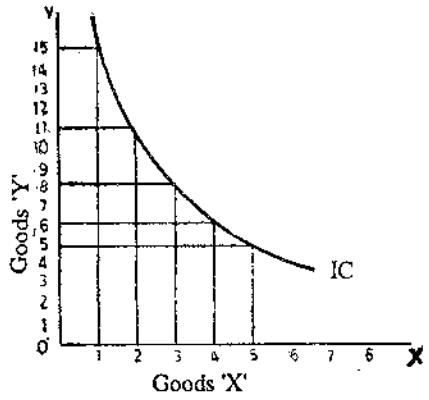


Fig- 5.1 A

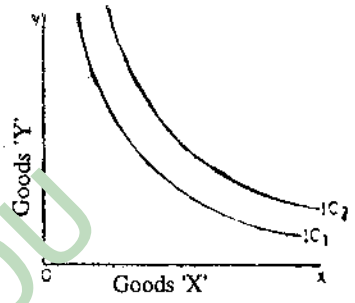


Fig- 5.1 B

Thus when there are two different curves (I & II), combinations on indifference curve I will be of equal value and similarly combination on the indifference curve II will be of equal value. But combinations on the higher indifference curve will have greater value than combinations on the lower indifference curve. The higher the indifference curve or the farther it is from the origin 'O', the higher the level of satisfaction from the combination of two commodities.

5.3 Assumptions Behind Indifference Curve Analysis

Before we discuss the properties of indifference curve it will be useful if we mention the assumption about the psychology of the consumer which one generally makes in indifference curve analysis.

Assumption - I

It is assumed that a consumer will also prefer more of a piece of goods to less of another, that is, if he is over supplied or over satieted with one of them he will prefer a smaller quantity, of that one to the larger quantity. It is thus assumed that the consumer has not yet reached the point of satiety in the consumption of any of the goods. This assumption is therefore known as *non-satiety assumption.*

Assumption - II (Transitivity)

By transitivity let us suppose there are three comninations of two goods, X, Y and Z. If the consumer is indifferent between combination X and Y and also between X and Z, it is obvious that by *law of transitivity* he will be indifferent between combination of Y and Z, which implies that consumer's tastes are quite consistent.

Assumption - III (Diminishing Marginal Rate of Substitution)

According to the principles of diminishing marginal rate of substitution, it is asumed that the consumer will be prepared to give up less and less of goods Y for each additional unit of X. In the indifference schedule given earlier we have seen that in the beginning the consumer gives up 4 units of Y for the gain in one additional unit of X but the level of satisfaction remains the same. It follows that he gives up 3 units of Y for an additional unit of X and later on 2Y for 1X and so on. Thus the marginal rate of substitution of X for Y (MRS xy) diminishes as more and more of goods X is substituted for goods Y.

Check Your Progress-2

2. *List the assumptions made for indifference curve analysis.*

5.4 Properties of Indifference Curves

Based on the above assumptions we can proceed to deduce the properties of indifference curves namely:

a) Indifference curves slope downwards from left to right.
b) Indifference curves are convex to the origin.
c) Indifference curves cannot intersect each other.
d) A higher indifference curve represents higher level of satisfaction than the indifference curve at the lower level.

5.4.1 Indifference curves slope downwards from left to right

This property implies that an indifference curve has a negative slope which means that when the amount of one piece of goods in the combination is increased, the amount of the other good is reduced so that the loss of satisfaction by giving up the first good is compensated for the gain the satisfaction by additional unit of the other good. (See figure 5.1). If the indifference curves do not slope down wards from left to right, they can be horizontal or they must slope upwards from left to right. Let us examine the horizontal indifference curve in the figure given below.

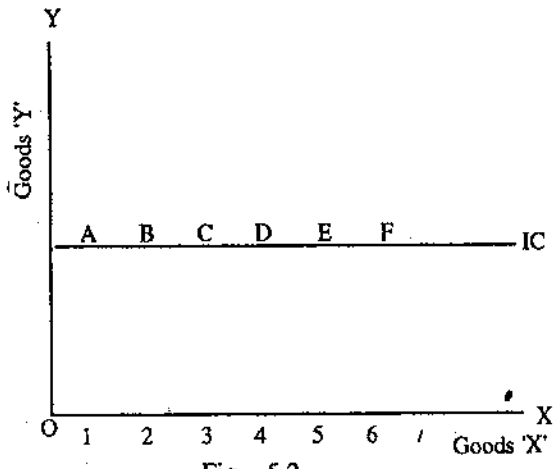


Fig. - 5.2

If the indifference curve had the shape of horizontal straight line as given above it would mean that all combinations along the curve are of equal value i.e., 4X+1Y, 4X+2Y,4X+3Y and so on. But this cannot be so if our first assumption is to hold good, i.e., a consumer always prefers a larger amount of a good to a smaller one. Hence each succeeding combination is better than the previous one, so much so the consumer cannot be indifferent between the various combinations. He would definitely prefer a combination including a larger amount of one commodity with the same amount of the other to a combination including a smaller amount of one commodity with the same amount of other. Therefore, an indifference curve cannot be horizontal since different combinations on the curve will differ in importance and satisfaction.

The other alternative to a downward sloping indifference curve would be an upward sloping indifference curve as shown below:

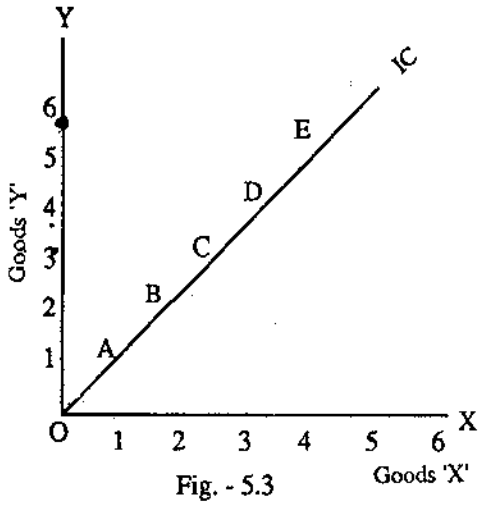


Fig. - 5.3

If the indifference curve were upward sloping to the right, it would mean that combination which combines more of both the goods could give the same satisfaction to the consumer as the combinations which had smaller amounts of both the goods. This is clearly invalid because the consumer would always prefer the combination containing more of both the goods to a combination containing less. Therefore, the consumer prefers the same combination to the other. He cannot be indifferent between them. It follows therefore that indifference curve cannot slope upwards to the right because in such a case the combinations on the curve will be of different significance and not of equal significance which is quite contradictory to the property of an indifference curve. Hence the indifference curve must necessarily slope downwards from left to right as given below in figure 5.4 A.

The down ward sloping indifference curve would mean that all combinations on the curve are of equal significance and he is therefore indifferent between them for every increase in the amount of X, there is corresponding decrease in the amount of Y.

5.4.2 Indifference curves are convex to the origin

The property of indifference curve being convex to the origin follows from the assumption of diminishing marginal rate of substitution. This may be illustrated below (see figure 5.4. B).

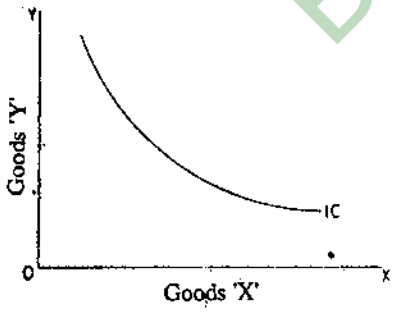


Fig. - 5.4 A

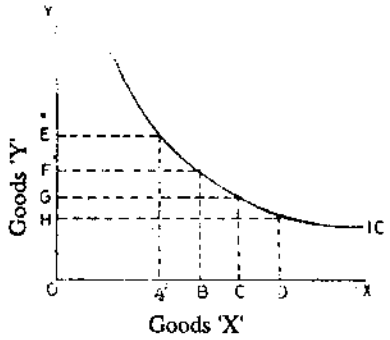


Fig. - 5.4 B

Along OX we have made AB = BC = CD representing three equal units of commodity X. In order to get more Y, the consumer will exchange X for Y. It will be clear from the above figure that as more and more of X is acquired, for each extra unit of X the consumer is wiling to part with less and less of Y i.e., MRS xy diminishes as more and more of X is substituted for Y. Thus the convex indifference curves are consistent with the principle of diminishing MRS xy. We therefore conclude that indifference curves are convex to the origin.

If the indifference curve is concave to the origin it goes contrary to the Law of diminishing marginal utility. A concave indifference curve will imply that the MRS xy increases as more and more of X is substituted for Y as shown below.

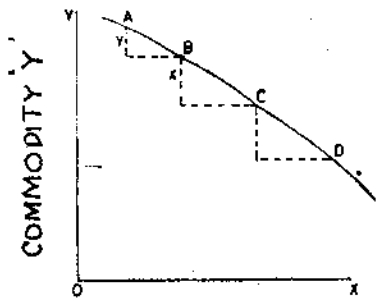


Fig-5.5

It can be seen from the figure 5.5 that as more and more of X is acquired for each extra unit of X, the consumer is willing to part with more and more of Y. i.e., MRSxy increases as more and more of X is substituted for Y. Thus if the principle of diminishing marginal rate of substitution is valid, then indifference curves cannot be concave to the origin.

5.4.3 Indifference curves cannot intersect each other

Another important property of indifference curves is that they cannot intersect each other. If they should intersect we arrive at self-contradictory or absurd conclusions. In the figure 5.6 two indifference curves are shown cutting each other at point C.

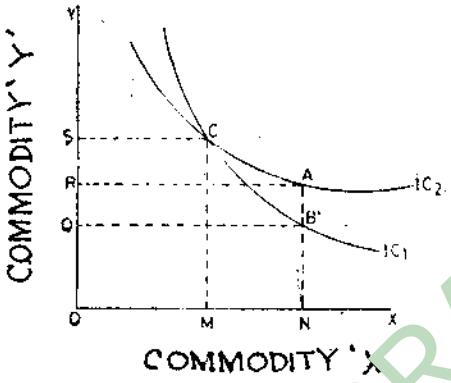


Fig.5.6 A

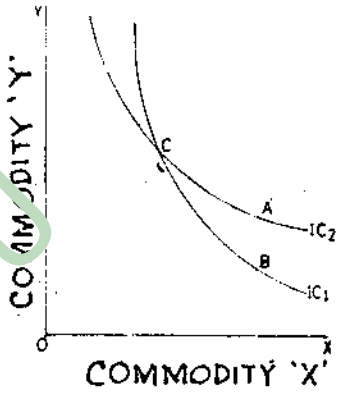


Fig. 5.6 B

Taking IC_2 No.1 first

OM of X + OS of Y = ON of X + OR of Y

Taking IC_1 No. 2

OM of X + OS of Y = ON of X + OQ of Y

Therefore OR of Y = OQ of Y

Hence, ON of X + OR of Y = ON of X + OQ of Y, but conclusion that OR of Y = OQ of Y is absurd.

Two indifference curves cannot intersect and can also be shown by the law of transitivity. Take point A on IC_2 and point B on IC_1 vertically below A. Combination A &C will give the consumer equal satisfaction because they lie on the same indifference curve IC_2. Likewise between combination B&C on IC_1 the consumer is different because they give him same level of satisfaction. If combination A is equal to combination C in terms of satisfaction, and combination B is equal to combination C, it follows that the combination A will be equivalent to B in terms of satisfactions. But a glance at the figure will show that this is absurd since combination A contains more of commodity than combination B, while the amount of commodity is the same in both the combinations. Thus the consumer will definitely prefer A to B, i.e., A will give more satisfaction to the consumer than combination B. We therefore conclude that the indifference curves cannot cut each other.

5.4.4 A higher indifference curve represents higher level of satisfaction than the indifference curve at the lower level.

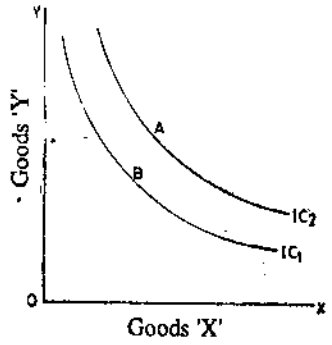


Fig. - 5.7

The combinations which lie on a higher indifference curve will be preferred to the combinations which lie on a lower indifference curve because combination A contains more of both the goods than the combination B. Hence, combination A on a higher indiference curve will give him more sarisfaction than the combination B on lower indifference curve.

Check Your Progress - 3

3. What is the slope of an indifference curve? Show it graphically.

4. Can two indifference curves intersect each other?

5. In diagram 5.7, which indifference curve gives higher level of satisfaction and why?

5.5 Consumers' Equilibrium

5.5.1 Price Line or Budget Line

In order to explain consumers, equilibrium there is also the need for introducing the price line into the indifference curve diagram which represents the prices of the goods and consumers' income.

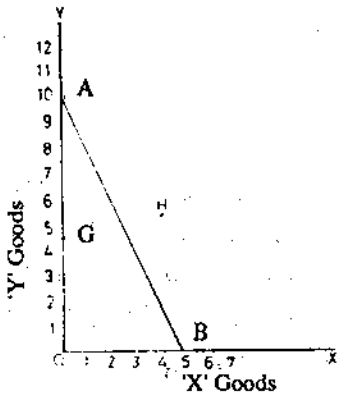


Fig. - 5.8

Suppose our consumer has got Rs. 100/- to spend on X and Y. Let the price of commodity X in the market be Rs. 20/- per unit and that of Y Rs. 10/-. If he spends the whole of his income on X he would buy 5 units of X and if the entire amount is spent on Y, he would buy 10 units of Y. These two, therefore represent the two extreme alternatives open to the consumer. In other words he can buy any conbination that lies in the price line with his given income cambination outside the price line AB will be beyond the reach of the consumer with his given income and price of goods and any point within the reach of the consumer but on such combinations he will not be spending all his income. He will not be at point G inside AB since by assumption he spends all his income on X or Y. Therefore, the consumer with given income under given market conditions will have different opportunities of consumption along path AB.

By superimposing the indifference curve on the price or budget line, the equilibrium position of the consumer is determined. A consumer is said to be in equilibrium when he is buyiung such a combination of goods which leaves him with no tendency to rearrange his purchases of goods.

Check Your Progress - 4

6. What is meant by price line? show it graphically.

5.5.2 Asumptions

The following assumptions are made to explain the consumers' equilibrium.

a) He has a given amount of money to spend on the two goods.

b) Prices of all the goods are fixed in the market so that no individual consumer can alter the price.

c) Goods are homogeneous and divisible.

d) The consumer is rational, i.e., the consumer will maximise his satisfaction with given income and prices of goods.

5.5.3 Conditions

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.

The *first condition* is that the marginal rate of substitution be equal to the ratio of commodity prices.

$$MRSxy = \frac{MUx}{MUy} = \frac{Px}{Py}$$

This is a necessary but not a sufficient condition for equilibrium. The *second condition* is that the indifference curves be convex to the origin. This condition is fulfilled by the axiom of diminishing MRS.

Check Your Progress - 5

7. What are the conditions for a consumer to be in equilibrium?

5.5.4 Graphical Presentation

Given the indifference map of the consumer and his budget line, the equilibrium is defined by the point of tangency of the budget line with the highest possible indifference curve. At the point of tangency the slope of the price line Px/Py and of the indifference curves ($MRS_{xy} = MU_x/MU_y$) are equal.

$$\frac{MU_x}{MU_y} = \frac{P_x}{P_y}$$

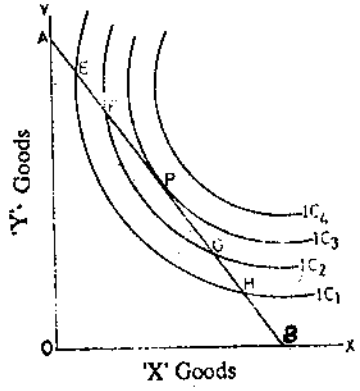


Fig. - 5.9

Thus the first order condition is denoted graphically by the point of tangency of the two relevant curves. The second order condition is implied by the convex shape of the indifference curves. The consumer maximises his utility by buying OX and OY of the two comodities. Any other possible combination of the two goods either would lie on a lower indifference

curve and thus yield less satisfaction or would be unattainable. Take point E which also lies on the same price line AB but E lies on a lower indifference curve IC_1 and therefore will yield less satisfaction than P. Likewise points F,G,H are also rejected in favour of P, since they lie on lower iddifference curve. It is thus clear that of all combinations lying on AB combination, P lies on the highest possible indifference curve and yield maximum possible satisfaction and therefore the consumer will be in the equilibrium position at point P.

Only at the tangency point of P, the slopes of the price line and indifference curve are equal. The slope of the indifference curve, while the slope of the price shows the MRS_{xy} line, indicates the ratio between the prices of the two goods. At points EF, the marginal rate of substitution (MRS_{xy}) is greater than the given price ratio; hence he will buy more of X than Y and come down along the price line. He will continue to do so to till $MRS_{xy} = P_x/P_y$. On the contrary at points GH, MRSxy is less than the given price ratio. Therefore it will be to the advantage of the consumer to substitute good y for good x and thereby move up the price line AB until the $MRS_{xy} = P_x/P_y$. Therefore only at point P, the comsumer is in equilibrium because at that point the price line is tangent to the indifference curve or in other words the marginal rate of substitution of good x for good y must be equal to the ratio between the prices of the two goods.

5.6 Income, Substitution and Price Effects

5.6.1 Income Effect

Another concept associated with indifference curves is the income effect. So far we have assumed a consumer with a given income buying two different commodities at given prices. We must also consider how the consumer will react in regard to his purchases of the commodity when his commodity income changes while prices of the goods and his tastes and preferences remain unchanged. Thus the income effect means the change in consumer's purchases of the goods as a result of change in his income. The income effect is illustrated in the figure 5.10.

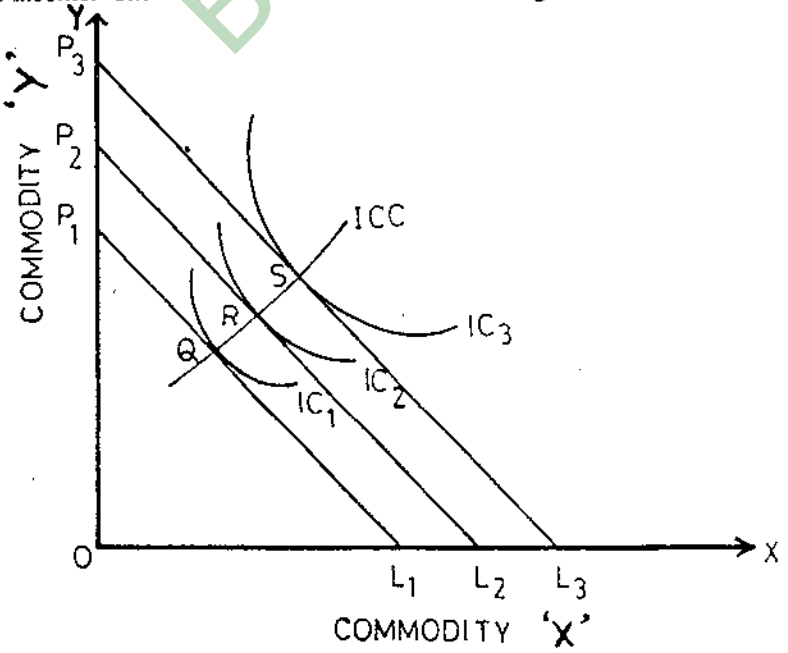


Fig. - 5.10 : Income Consumption Curve

With given price and a given money income as indicated by price line P_1L_1 the consumer is in equilibrium at point Q (see fig. 5.10). If the income of the consumer increases, with increased income, he would be able to purchase larger quantities of both the goods. As a result of a change in

his income, the price line will shift upwards to the right and will be parallel to the price line $P_2 L_2$. With further rise in income, the price line shifts to $P_3 L_3$ and the consumer is at equilibrium at S. If the various points of Q,R & S showing consumer's equilibrium at various levels of income are connected, we will get the income consumption curve. *Income consumption curve is thus the locus of equilibrium points at various levels of consumer's incomes.*

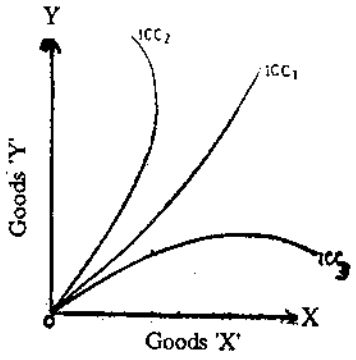


Fig-5.11

If the income effect is positive for both the goods X and Y, the consumption curve will slope upwards to the right as given below by ICC1 in fig.-5.11. If the income effect is negative for good X, ICC will slope backward to the left as ICC2 and will slope downwards to the right as ICC3 if commodity Y happens to be an inferior one.

5.6.2 Substitution Effect

Yet another factor responsible for the changes in the consumption of commodity is the substitution effect. Under this effect we assume change in prices for a corresponding change in money income with the result that the consumer is neither better off nor worse off than before, i.e., the real income of the consumer remains the same. However, when prices change, commodities which are cheaper would be substituted for commodities which are dearer. This result is known as substitution effect.

Thus substitution effect is illustrated below:

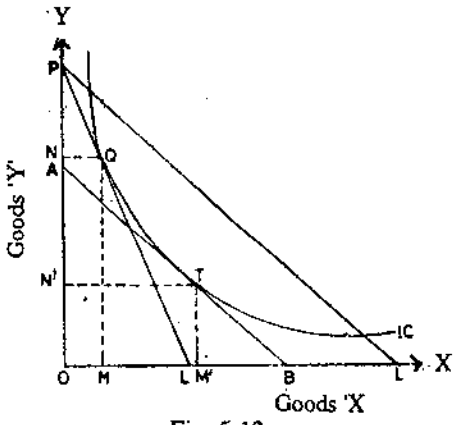


Fig. 5.12

With the given income and prices, the consumer is at equilibrium at point Q on the indifference curve, purchasing ON of commodity of Y and OM of commodity X. Suppose the price of commodityX falls, the price line shift to PL1. With this fall in price the consumer's real income or purchasing power would increase. In order to find out the substitution effect, the gain in real income should be wiped out by reducing the money income of the consumer that forces him to stay on the same indifference curve. When some money income is taken away, the price line is shifted to a new position PL_1 parallel to AB which means that the reduction of consumer's income by the amount PA (in terms of Y) or L1B (in terms of X) has been made to keep him on the same indifference curve. The consumer would therefore rearrange his purchases of X and Y and will substitute X for Y since X is now relatively cheaper and Y is now relatively dearer. Thus in order to buy more of X he moves on the same indifference curve from point Q to point T. Thus, increase in the purchase of commodity x by MM' and the decrease in the purchase of commodity Y by NN' is due to the change only in the relative prices of commodity x and y, since the effect due to the gain in real income has been wiped out by making a simultaneous reduction in consumer's income. Therefore movement from Q to T represents the substitution effect. Substitution

effect on commodity X, is the increase in its quantity purchased by MM' and substitution effect on Y is the fall in the quantity purchased by NN'. In short, the substitution effect implies that a change on the real income of a consumer due to a change in the price is compensated by a corresponding change in money income but the relatively cheaper commodity is bought in the place of the dearer one.

5.6.3 Price Effect

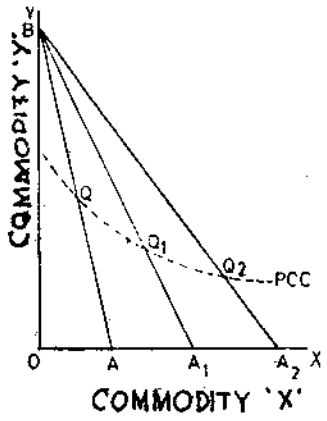


Fig-5.13

This effect shows the reaction of the consumer and measures the full effect of the change in the price of the comodity on the quantity purchased with given money income.

To begin with, the consumer is at equilibrium at point Q on budget line AB. With the fall in the price of X, the budget line shifts to the right BA_1 and the consumer can now buy OA_1 of X of OB of Y. A further fall in price of X will shift the budget line to BA_2 and so on. By joining Q,Q_1 and Q_2 we get a curve called the *price consumption curve*. The price consumption curve shows the price effect.

5.7 Derivation of Demand Curve from Indifference Curve

The demand curve can be derived from indifference curves. This is done by measuring money on Y-axis and units of X commodity on X-axis. As the price of commodity X falls, the consumer will be moving to a higher indifference curve. With the help of unit price of X, the demand curve for commodity X can be drawn, where it will be downward sloping indicating that more and more of X will be bought as price of X falls.

5.7.1 Graphic Presentation

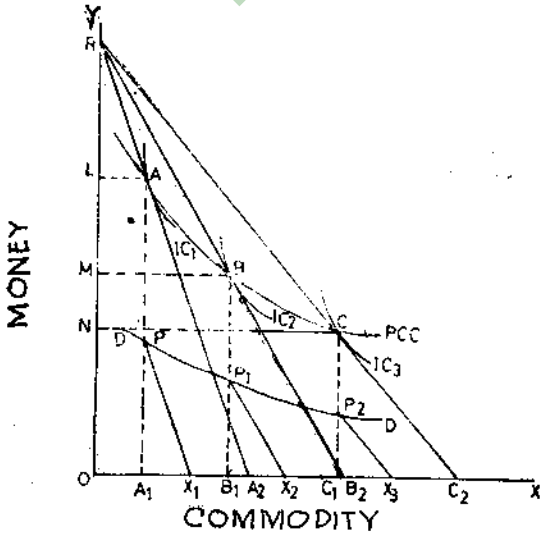


Fig.- 5.14

Money is measured along Y-axis and commodity X along X -axis. To begin with, the consumer is at equilibrium position at A, where the price line RA_2 is tangential to indifference curve IC_1. If there is a fall in the price, the price line shifts to RB_2 and the consumer has a new equilibrium position at B. With everyfall in the price of X, the consumer moves from one position of equilibrium

to another and joining all these equilibrium points we get price consumption curve. The price of one unit of X will be the total amount of money divided by the total commodity of X. X is the slope of RA_2 or the price of X is RC/OA_2. The price of commodity at B will be OR/OB_2. Therefore, when the consumer moves from A to B and B to C, he is buying more and more of X at lower and lower prices.

In order to plot points which when joined would give a demand curve, mark off a distance to the right of A, representing one unit of good X. Now suppose AX is one unit of good. From X_1, draw a line parallel to RA_2, the price line. Being parallel to the price line RA_2, the slope of PX_1 must be the same as slope of RA_2 and hence the slope PX_2 is the price of one unit of X. Similarly mark off a distance B_1X_2 to the right of B_1 which is again a unit of X and therefore parallel to B_2 and so on. By joining P_1P_2 we get demand curve DD. Demand curve DD shows that with every fall in the price of X the amount of X purchased increases.

Check Your Progress - 6

8. *What do you learn from income effect?*
9. *What is substitution effect?*
10. *What is meant by price effect?*

5.8 Summing Up

Indifference curve analysis is based on ordinal measurement of utility. By consuming a combination of comodities, consumer can compare the different utilities. Indifference curve is the line of all those combinations of two commodities, say X and Y goods, which yield equal satisfaction to the consumer. A consumer gets equilibrium when the ratio of margianl utilities from two commodities is equal to the ratio of commodity prices and when the indifference curves are convex to the origin. The ratio of commodity prices is explained through price line.

In the last part, we have discussed the three efects which are associated with ordinal utility analysis, namely, income, substitution and price effects.

– Dr. N. Lingamurthy

5.9 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H. S. Agarwal : Micro Economics/Principles of Economics

5.10 Model Examination Questions

I. Answer the following questions in about 30 lines.

1. Why do indifference curves slope downwards?
2. Examine the properties of indifference curves.

3. Explain the consumers' equilibrium with the help of indifference curve analysis.
4. Explain diagramatically the income, substitution and price effects.

II. Answer the following questions in about 15 lines.

1. What are indifference curves? Explain them with the help of indifference schedule.
2. Can two indifference curves intersect each other?
3. What is price line? Explain it diagrammatically.
4. What are meant by income and substitution effects?

Unit - 6 : Theory of Demand

Contents

6.0 Aims and Objectives

The aim of this unit is to explain what is demand, what are the determinants of demand and what is 'law of demand'.

After reading the unit you will be able to

* explain the meaning of demand,
* identify the kinds of demand,
* derive the demand curve,
* list the factors determining the demand,
* define the law of demand, and
* draw the limitations of the law of demand.

6.1 Introduction

The purpose of the theory of demand is to determine the various factors which affect demand. It does not discuss only the law of demand, since it is misleading in that it concentrates on price as the sole

determinant of demand. However, demand has a multivariate relationship as it is detrmined by many factors simultaneously. Some of the important determinants of the market demand for a particular product are the price of the product itself, consumers' income, prices of other commodities in the market, consumers' tastes, income distribution, total population, consumers' wealth, credit availability, government policy, past levels of demand and past levels of income. But the traditional theory of demand has discussed only four of the above determinants – the price of the commodity, the price of other commodities, incomes and tastes.

6.2 Meaning of Demand

In our daily life, the word, 'demand', is used in a very loose sense to mean the desire of a person to purchase a commodity or service. But in the subject of economics it has a specific meaning. Demand implies more than a mere desire to purchase a commodity. It means that the consumer is both willing and able to purchase the commodity which he desires. His desire should be backed up by his purchasing power. A poor person's desire to travel by air from Hyderabad to Delhi has no significance, since he does not possess the ability to pay for it. On the other hand, another person's desire to travel by air backed by purchasing power constitutes 'demand'. *Demand*, thus, *means the desire of the consumer for a commodity backed by purchasing power*. These two factors are essential. If a consumer is willing to pay but is unable to pay, his desire will not become demand. Similarly, if the consumer has the ability to pay but is not willing to pay, his desire will not be called 'demand'.

Check Your Progress - 1

1. What is meant by demand in economics?

6.3 Kinds of Demand

There are three kinds of demand.

(a) Price demand

(b) Income demand, and

(c) Cross demand

6.3.1 Price Demand

It refers to the various quantities of a commodity or service that a consumer would purchase at a given time in a market at various hypothetical prices. It is assumed here that other things such as consumers' income, his tastes and prices of interrelated goods remain unchanged. The quantity demand of a particular commodity depends on the price of that commodity. Mathematically, this can be expressed in the following form.

$D_x = f(P_x)$.

Where, 'Dx' stands for demand for commodity x,

'f' denotes function and 'P_x' for price.

The functional relationship between price and quantity demanded is well acepted. Consumer behaviour is so consistent that economists feel justified in making the strongest possible generalisation

concerning the relationship between price and demand. The relationship between price and demand is called inverse relationship. This relationship is generalised by the downward sloping demand curve.

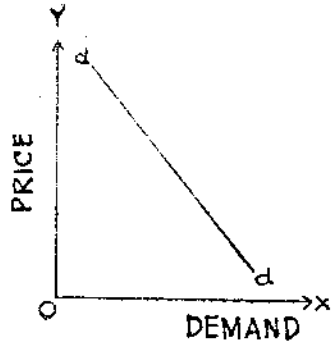


Fig-6.1

The functional relationship between quantity demand and price is illustrated with the help of a demand curve. In the diagram 6.1 price is taken on the vertical exis and the quantity demanded on the horizontal axis. The curve 'dd' is labelled as demand curve.

In this diagram, it is easy to visualise the inverse relationship between price and quantity for the demand curve which is sloping downwards from left to the right.

6.3.2 Income Demand

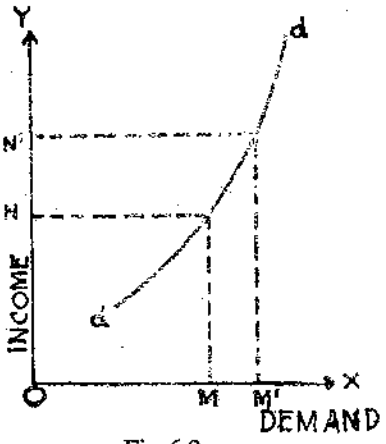


Fig-6.2

It refers to the various quantities of goods and services which would be purchased by the consumer at various levels of income. There is a critical functional relationship between income changes and change in consumption quantity. This functional relationship is defined mathematically as $D_x = f(Y)$. It means, the quantity of good 'X' purchased is a function of consumer's income. The functional relationship between income and quantity demanded may be inverse or direct. There is not a great consistency of response by consumers with respect to quantity variation for different goods as incomes change. Consequently, it is difficult to make strong generalisations with respect to this functional relationship. In the case of superior or normal goods, the demand will increase with the increase in the incomes. The diagram 6.2 illustrates the relationship between income and the demand for a superior or normal good.

In this diagram, 'OX' axis represents demand for superior or normal goods, while 'OY' axis represents income. When the consumer's income is ON, his demand is OM. But when his income increases from ON to ON', the demand increases from OM to OM'.

As against this, the demand for the inferior commodity decreases with the increase in income. This relationship is called inverse relationship. This can be explained with the help of a diagram.

In the diagram 6.3 at 'ON' income, the demand for the commodity is 'OM'. But when the consumer's income increases from ON to ON', the demand of the commodity decreases from OM to OM'

Thus, in the case of normal goods, the income and demand are positively correlated while in the case of 'Inferior' or 'Giffen Goods' the relationship is negative.

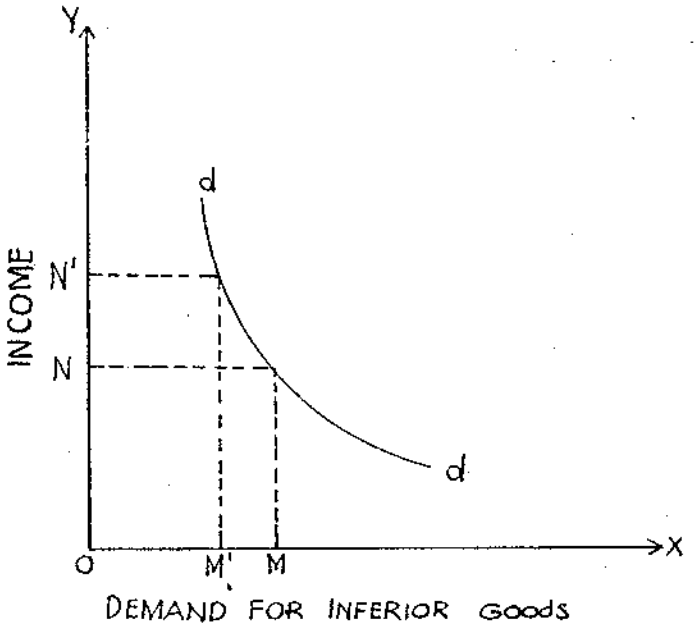


Fig. - 6.3 : Demand for Inferior Goods

6.3.3 Cross Demand

It means the various quantities of commodities or services which will be purchased with reference to changes not of this commodity but of other interrelated commodities. These goods are either substitutes or complementary goods. The corelation between the demand for one commodity and the price of another may be positive or negative according to the manner in which these two commodities are related to each other.

If the two commodities are *substitutes*, then obviously they satisfy the same want. The more the consumer buys of one, the less he requires of the other. For example, tea and coffee are good sustitutes. If the price of tea increases, the consumers may buy less of it as they can buy more of coffee. Thus, a rise in the price of tea increases the demand for coffee. A fall in the price of tea on the other hand, may reduce the demand for coffee because the consumers will now increase their intake of tea. This relationship can be illustrated with the help of a diagram. When the price of tea increased from ON to ON', the demand for coffee increased from OM to OM'.

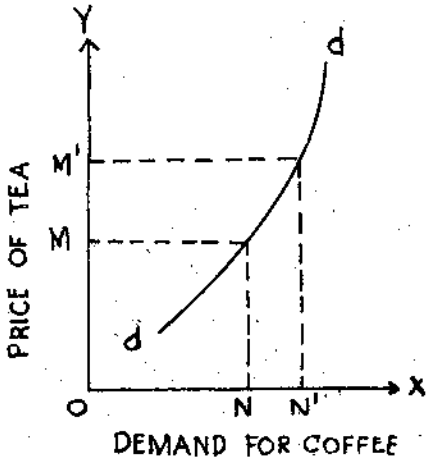


Fig. - 6.4 A : Demand curve for substitute goods

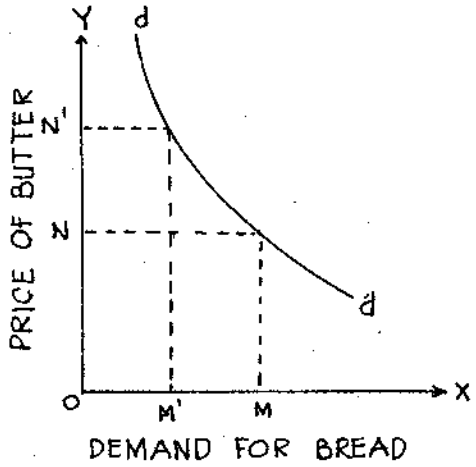


Fig. - 6.4 B : Demand for complementary goods

If the two commodities are *complementaries*, then the consumer requires both the commodities to satisfy his want. Bread and butter can be taken as complementary goods. If price of butter increases the consumer may buy less of bread as the price of bread also increases. Thus a rise in the price of butter decreases the demand for bread. The diagram 6.4 B explains this relationship. When the price of butter fell from ON' to ON , the demand for bread increased from OM' to OM.

Check Your Progress - 2

2. *What is price demand?*
3. *Diagramatically show the relationship between price and demand.*
4. *How income is related to demand in the case of normal or superior goods?*
5. *Explain the cross demand in regard to substitute goods.*

6.4 Demand Schedule and Demand Curve

6.4.1 Demand Schedule

A demand schedule can be constructed to any comodity if the list of prices and the quantities purchased at those prices are known. An individual demand schedule is a list of the various quantities of a commodity which an individual consumer purchases at various levels of prices in the market. A demand schedule, thus, states the relationship between the two variables of price and quantity demanded.

The following is an imaginary **demand schedule** for oranges.

Price (Per dozen) Rs.	Quantity demanded (In dozens)
1	15
2	12
3	10
4	7
5	5

On the basis of this schedule, we can draw the demand curve for oranges.

6.4.2 Demand curve

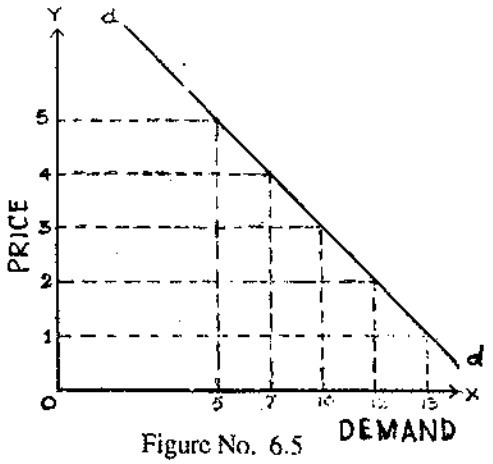


Figure No. 6.5

In the diagram 6.5 the prices of oranges are given on 'OY' axis and the quantities demanded of oranges are given on 'OX' axis. When the price per dozen is Rs. 1/- only, 15 dozens are demanded. We plot this point on the diagram. We plot the other points in the same manner and by joining these points we get the curve. The demand curve "dd" shows the direct relationship between the price of oranges and the quantity demanded of them.

Check Your Progress - 3

6. What is demand schedule?

7. Derive demand curve with the help of an imaginary demand schedule.

6.5 Factors Determining Demand

In addition to the determinants of demand which we discussed above, i.e., **price of the commodity, income of the consumer and the prices of substitutes**, there are some other factors which can bring about a change in demand. They are:

a. Change in fashions: When fashions change, the goods that are out of fashion will be less in demand eventhough they may become cheap.

b. Change in weather: Cotton clothes will have more demand in summer and woollen clothes will have more demand in winter. The changes in the prices of above goods in those seasons will have consequent change in the demand for them.

c. Change in the quantity of money in circulation: If the quantity of money under circulation in an economy increases, people will have more purchasing power. Consequently, demand for the commodities will also increase.

d. Change in population: A change in the size and total composition of population will bring about a change in demand. If the children are more in the total population, the demand for toys increases. On the other hand, if old poeple are more, the demand for walking sticks, false teeth and medicines will increase.

e. Change in wealth distribution: If wealth is more evenly distributed, the demand for necessities and comforts by the poor people will increase as they were denied of them so far, while the demand for luxuries will decrease.

f. Technical progress: Due to technical progress, new discoveries enter the market. Consequently, old goods are discarded and the demand for new goods increases.

g. Advertisement: Advertisement in News Papers, Radio and Television will bring about changes in the demand for commodities in the market.

Check Your Progress - 4

8. List the determinants of demand.

Note : Price of the commodity, income of the consumer and prices of other related commodities are the factors which are major determinants of demand. Other determinants may also be listed.

6.6 Law of Demand

The law of demand tells us the functional relationship between the price of a commodity and its quantity demanded in the market. It means that it shows us an inverse relationship between the above two variables. In the words of Alfred Marshall the law of demand can be stated thus, " the greater the amount to be sold, the smaller must be the price at which it is offered in order that it may find purchasers; or in other words, the amount demanded increases with a fall in price and diminishes with a rise in price". But the above law operates only under the assumption that "other things remaining constant". The above phrase implies that when we state the law of demand, we assume, (i) that the income of consumers do not change, (ii) the tastes and fashions of consumers remain unchanged; and (iii) the price of other related commodities remain the same. The law of demand will operate only if the above things remain unchanged. A change in any one of them will make the law inoperative in the market.

Check Your Progress - 5

9. What is law of demand?

6.7 Exceptions to the Law of Demand

The law of demand is only a general statement. There are said to be a few exceptions to this general statement. They are:

6.7.1 Giffen's Paradox

According to the law of demand when the price of a commodity increases, its demand must decrease. But some times the demand curve instead of sloping downwards may rise upwards. In other words some times people may buy more when the prices are high. Though such occassions are rare, we can imagine about some of them. This type of situation was first discovered by Sir Robert Giffen (1837-1910). Goods of this type are known as Giffen Goods, after the name of the man who discovered it. The Giffen goods are those that violate the law of downward sloping demand.

This can be explained with the help of a small example. Let us take the case of a poor man who spends a major part of his income on an inferior comodity like 'bajra'. The remaining small amount he will be spending on other items. Now let us assume that the price of bajra rises, but the prices of other commodities remain the same. Let us assume that the poor man's income also remains unchanged. He would now be worse off than before. His real income will fall. Therefore, the monthly sum of money which he used to allot to bajra buys less than before due to price increase. If he buys the other commodities in the same quantities and spends the remaining amount only on bajra as before, he will be forced to starve. Hence, the consumer would readjust his expenditure cutting down on other items in order to not only maintain himself but also to increase the quantity he bought per month. As this strange phenomenon was first observed by Sir Robert Giffen, it has been named as *'Giffen's Paradox'*. Giffen discovered in Britain that faced with an increase in the price of bread, the families in working class of Britain were compelled to curtail their consumption of meat in order to purchase more bread.

6.7.2 Prestige Goods

Some times, people purchase certain goods as their possession confers a higher social status on them. For example, diamonds and precious stones are purchased by the richer sections only to maintain high prestige in the society without caring for the high price of the goods.

6.7.3 Speculation

Some times, the price of a commodity might be increasing and it is expected to increase still further. The consumers will buy more of the commodity at the higher price than they did at the lower price. Thus an increase in price may not be accompanied by a decrease in its demand which is contrary to the law of demand.

Check Your Progress - 6

10. What are meant by Giffen goods?

6.8 Summing up

As you have learnt the term 'demand' implies a different meaning in economics. Demand for a commodity depends on the willingness of a consumer and his purchasing power. Three kinds of demand–price,income and cross demand–explain the major factors which determine the demand for a commodity. Demand also depends on other factors, such as, fashions, weather, velocity of money, population, advertisement, etc.

Demand is inversely related to price. Income affects the demand in a positive way for superior and normal goods and in a negative manner for inferior and giffen goods. The prices of other related commodities also affect the demand for a particular commodity.

Law of demand explains that, when other things remain constant, the price of a commodity and its quantity demanded are inversely related.

– Dr. N. Lingamurthy

6.9 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory

2. H.S. Agarwal : Micro Economics/Principles of Economics

6.10 Model Examination Questions

I. Answer the following questions in about 30 lines.

1. Distinguish between different kinds of demand.
2. What are the determinats of demand? Explain them.
3. What is the law of demand? Derive the demand curve with a demand schedule. Explain the limitations of the law of demand.

II. Answer each of the following questions in about 15 lines.

1. What is the meaning of demand in Economics?
2. Explain the law of demand.
3. Explain the Giffen's Paradox.

Unit-7 : Elasticity of Demand

Contents

7.0 Aims and Objectives

The unit describes the meaning and kinds of elasticity of demand and it measures elasticity of demand through total outlay method , point method and arc method.

After reading the unit, you will be able to :

* define elasticity of demand,
* explain price, income and cross elasticities of demand ; and
* measure elasticity of demand by three methods.

7.1 Introduction

Elasticity is a tool by which we measure the degree of a dependent variable's responsiveness to changes in an independent variable. Although, elasticity has a wide variety of applications, many of its most interesting and useful applications are found in the study of consumption demand.

7.2 Meaning of Elasticity of Demand

Elasticity means sensitiveness or responsivness of demand to the change in price. In other words " elasticity is a measurement of the percentage responsiveness of a dependent variable to

percentage change in an independent variable". The responsiveness of demand may be small or great. Take the case of salt. Even a considerable fall in its price may not induce an appreciable extension in its demand and some times a slight fall in the price of a commodity may cause a considerable extension in its demand. The demand in the former case is 'inelastic' and in the latter case it is 'elastic'. According to Alfred Marshall, "the elasticity of demand in a market is great or small according as the amount demanded increases much or little for a given fall in price". But the demand in the real world cannot be completely elastic or inelestic. That is why we say that elasticity of demand is 'more or less'.

Check Your Progress - 1

1. Explain the term 'elasticity of demand.

Kinds of Elasticity of Demand

There are as many elasticities of demand as its determinants. The most important of these elasticities are :

1. Price Elasticity of Demand
2. Income Elasticity of Demand
3. Cross Elasticity of Demand

7.3 Price Elasticity of Demand

It is a measure of the responsiveness of demand to changes in the commodity's own price. It can also be expressed as the ratio of a relative change in quantity to a relative change in price. The formula for calculating the price elasticity of demand is :

$$E_p = \frac{\text{Percentage change in the quantity demanded of X}}{\text{Percentage change in the price of X}}$$

$$E_p = \frac{\frac{\Delta DX}{DX}}{\frac{\Delta PX}{PX}}$$

Where E_p stands for price elasticity.

If the percentages are known quantities, then the numerical size of E can be easily calculated. Let us suppose that the percentage increase in the quantity is 3 and the percentage fall in the price is 1. Then

$$E_p = \frac{3\%}{-1\%} = -3.$$

7.3.1 Kinds of Price Elasticity of Demand

Price elasticity of demand is generally classified into five categories. They are :

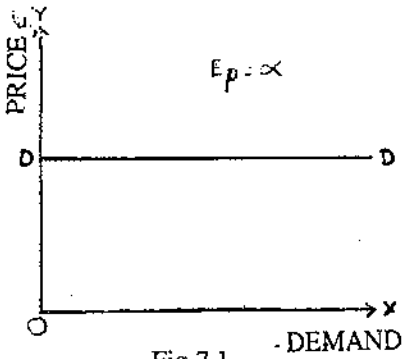


Fig-7.1

i) Perfectly Elastic Demand

It is a situation where the slightest rise in price causes the quantity demanded of the commodity to fall to zero. Similarly, the slightest fall in price causes an infinite increase in the quantity demanded of the commodity. This type of cases are exceedingly rare in the world. It can be shown with the help of a diagram. (see Fig. 7.1). Here , demand curve is a horizontal straight line.

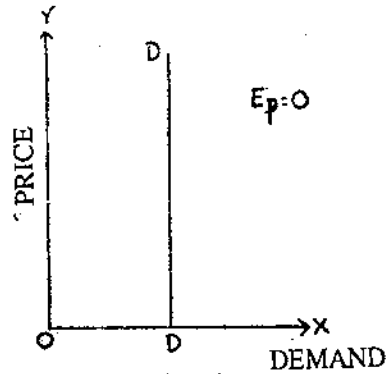


Fig-7.2

ii) Perfectly Inelastic Demand

In this case even substantial changes in the price will not bring about any change in demand. The demand in this case is insensitive or not responsive to changes in price. The elasticity of demand in this case is zero. Like perfectly elastic demand, cases of perfectly inelastic demand are also rare in real life. It can be shown with the help of a diagram also. See diagram 7.2. In this case, the demand curve is a vertically straight line.

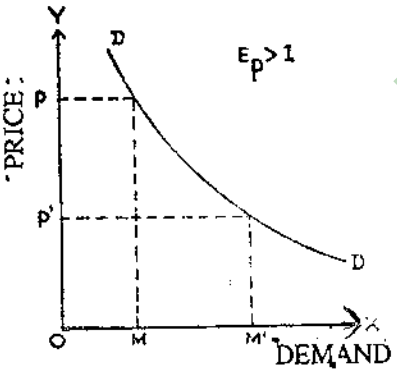


Fig-7.3

iii) Relatively Elastic Demand

It is a situation where a small proportionate change in the price of a commodity is accompanied by a larger proportionate change in its quantity demanded. Elasticity of demand here is said to be greater than unity. It can be shown in the diagram 7.3.

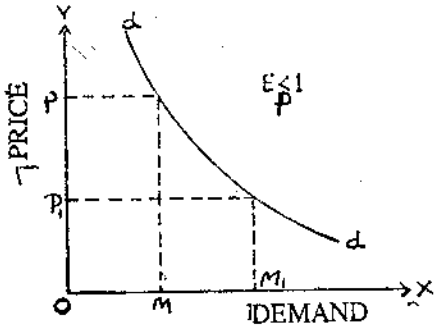


Fig. - 7.4

iv) Relatively Inelastic Demand

It is a situation where a substantial change in the price of a commodity is accompanied by a smaller proportionate change in its quantity demanded. Elasticity of demand here is said to be less than unity. It is shown in the diagram 7.4.

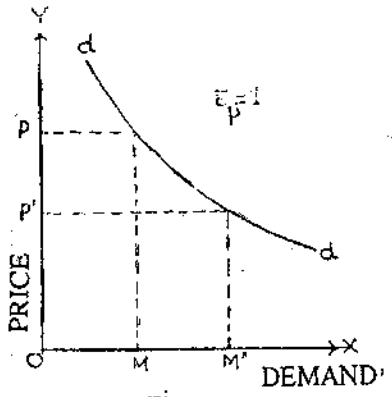


Fig. - 7.5

v) Unitary Eastic Demand

It refers to a situation on where a given proportionate change in price is accompanied by an equally proportionate change in the quantity demanded. Elasticity of demand here is said to be equal to unity. This is shown in the diagram 7.5.

The entire discussion about the price elasticity of demand can be summarised in the following table:

Table - 7.1: Price Elasticity – Measures, Meaning and Numenclature

Numerical measure of Elasticity	Verbal Description	Termonology
Zero	Quantity demanded does not change as price changes.	Perfectly inelastic
Greater than zero but less than one.	Quantity demanded changes by a smaller percentage than does price.	Inelastic
One	Quantity demanded changes by exactly the same percentage as does price.	Unit elasticity
Greater than one but less than infinity.	Quantity demanded changes by a larger percentage than does price.	Elastic
Infinity	Purchasers are prepared to buy all they can obtain at some price and none at all at an even slightly higher price.	Perfectly elastic

Source : Richard G. Lipsey, An Introduction to Position Economics, ELBS, 1974,p. 102.

7.3.3 Basic Determinants of Price Elasticity of Demand

According to Koutsoyiannis, the basic determinants of the elasticity of demand of a commodity with respect to its own price are :

1. The availability of substitutes : The demand for a commodity is more elastic if there are close substitutes for it. it.
2. The nature of the need that the commodity satisfies : In general, luxury goods are price elastic while necessities are price inelastic.
3. The time period : Demand is more elastic in the long run.
4. The number of uses to which commodity can be put : The more the possible uses of commodity, the greater its price elasticity will be.
5. The proportion of income spent on the particular commodity.

Check Your Progress-2

2. *What is the shape of demand curve when the elasticity of demand is unity ?*
3. *Show the shape of a perfectly elastic demand curve.*
4. *Depict the situation of a perfectly inelastic demand curve.*
5. *What are the basic determinants of price elastcity of demand ?*
6. *What is price elasticity of demand ?*

7.4 Income Elasticity of demand

The responsiveness of demand to changes in income is termed as income elasticity of demand. It can also be expressed as the proportionate change in the quantity demanded resulting from a proportionate change in income.

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

Symbolically, we may write

$$E_Y = \frac{\Delta D}{D} \div \frac{\Delta Y}{Y}$$

For normal goods income elasticity is positive. Some of the writers have used income elasticity in order to classify goods into "luxuries" and "necessities". A commodity is considered to be a luxury if its income elasticity is greater than unity. A commodity is necessity if its income elasticity is small.

The main determinants of income elasticity are :

1. The nature of the need that the commodity covers: The percentage of income spent on food declines as income increases (this is known as Engel's Law).
2. The initial level of income of a country: For example , a T.V. set is a luxury in an underdeveloped country while it becomes a 'necessity' in a developed country.
3. The time period: Because consumption patterns adjust with a time-lag to changes in income.

Check Your Progress -3

7. *What is meant by income elasticity of demand ?*

7.5 The Cross Elasticity of Demand

It is the responsiveness of demand to change in the price of other commodities. It can also be defined as the proportionate change in the quantity demanded of X resulting from a proportionate change in the price of Y.

$$E_{XY} = \frac{\text{Percentage change in the quantity demanded of X}}{\text{Percentage change in the price of Commodity Y}}.$$

Cross - elasticity may vary from minus infinity to plus infinity. Comlementary goods will have negative cross elasticities and substitute goods will have positive cross elasticities. The main determinant of the cross elasticity is the nature of the commodities relative to their uses. If two commodities can satisfy equally well the same need, the cross elasticity is high and vice-versa.

Check Your Progress -4

8. Define cross elasticity of demand.

7.6 Measurement of Elasticity

There are three methods for the measurement of elasticity of demand. They are :

i) Total Outlay or Expenditure Method;

ii) Point Method; and

iii) Arc Method.

7.6.1 Total Outlay or Expenditure Method

This method is associated with the name of Alfred Marshall according to which we measure the elasticity by examining the change in the total expenditure due to a change in Price. We can observe this in the following demand schedule.

Table - 7.2 : Demand Schedule for Tooth Brushes

Price per Tooth Bruth	Number demanded	Total amount spent
Rs. 2=00	2	Rs. 4=00.....(1)
Rs. 1=00	3	Rs. 3=00 .....(2)
Rs. 0=75	4	Rs. 3=00 .....(3)
Rs. 0=62	5	Rs. 3=10 .....(4)

In the above schedule, the total amount of money spent decreased with a fall in the price (increases with a rise in price) from Rs.2=00 to Re. 1=00, the total amount spent decreased from Rs. 4=00 to Rs. 3=00. In this case the elasticity is said to be less than unity. In between (2) and (3)

the total amount of money spent remained the same. It means that when the price decreased from Re.1=00 to Re. 0=75, the total expenditure remained at Rs. 3=00. In this case, the elasticity is said to be equal to unity. In between (3) and (4) the total amount of money spent increased with a fall in price (or deceases with a rise in price) the elasticity is said to be greater than unity. The total amount spent increased from Rs.3=00 to Rs.3=10. This method can also be represented with the help of a diagram.

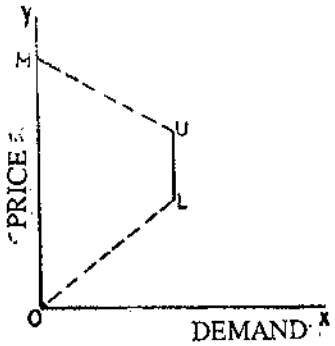


Fig-7.6

In the diagram 7.6, total expenditure is measured along OX axis and price along the OY axis . We get a backward sloping curve "OLUM " . The portion 'OL' represents less than unitary elasticity, because an increase in price decreases the total expenditure. The 'LU' portion represents unitary elasticity because a change has no effects on the total expenditure as it remains constant. The portion 'UM' represents elasticity more than unity, because an increase in price decreases the total expenditure and a decrease in price increases the total expenditure.

The main drawback of the total outlay method is that it does not help us to measure the elasticity of demand numerically . It simply tells us that elasticity of demand is equal to, greater than, or less than one.

7.6.2 The Point Method

The method is also suggested by Alfred Marshall. In this method, we take a straight - line demand curve joining the two axes and measure the elasticity between two points Q and Q1 which are assumed to be intimately close to each other.

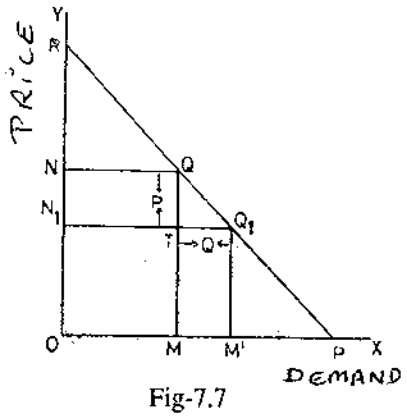


Fig-7.7

In the diagram 7.7 'RP' is the straight line demand curve which connects both the axes. In the beginning at the price QM, the quantity demanded is OM. Then the price changes to $Q_1 M_1$ and 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. The price elasticity of demand can be determined by the following formula.

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

The percentage change in quantity demanded can be found out thus :

$$\frac{\text{Change in the quantity demanded}}{\text{Initial quantity demanded}} = \frac{\Delta D}{D}$$

The percentage change in price can be found out thus:

$$\frac{\text{Change in Price}}{\text{Initial Price}} = \frac{\Delta P}{P}$$

$$\therefore \text{ Ed} = \frac{\dfrac{\text{Change in Quantity}}{\text{Initial Quantity}}}{\dfrac{\text{Change in Price}}{\text{Initial Price}}} = \frac{\Delta D}{D} \div \frac{\Delta P}{P}$$

***Appendex** (not Compulsory)*

or

Substituting the symbols , we have ,

$$Ed = \frac{\Delta D}{D} \div \frac{\Delta P}{P} = \frac{\Delta D.P}{\Delta P.D} = \frac{dD}{dP} \cdot \frac{P}{D}$$

In terms of above diagram , the equation is .

$$\frac{MM^1}{OM} \div \frac{NN^1}{ON} \text{ or } \frac{MM^1}{OM} X \frac{ON}{NN^1} = \frac{MM^1}{NN^1} X \frac{ON}{OM}$$

The smaller triangle QTQ1 is similar to the bigger triangle QMP. Therefore, the ratio of sides is the same. In other words,

$$\frac{MM\,1}{NN1} \text{ or } \frac{TQ1}{QT} \text{ equal to } \frac{MP}{QM}$$

We can now recast the above equation by substituting

$$\frac{MP}{QM} \text{ for } \frac{TR1}{QT} \text{ or } \frac{Q}{P}$$

$$Ed = \frac{MP}{QM} X \frac{ON}{OM} = \frac{MP}{QM} X \frac{QM}{OM} \text{ (... } ON = QM \text{)}$$

$$= \frac{MP}{OM} \text{ (after eliminating QM on both sides).}$$

The price elasticity of demand is therefore , $\frac{MP}{OM}$. Now we have got two traingles, ie., QMP and RNQ which are similar to each other. Therefore, the ratio of their sides is also the same.

As such $\frac{MP}{OM}$ *will be the same as* $\frac{QP}{RQ}$ *and* $\frac{QM}{RN}$ *(Since OM is the same as NR).*

$$Hence, Ed = \frac{MP}{OM} \text{ or } \frac{QM}{RN} \text{ or } \frac{ON}{RN} \text{ or } \frac{QP}{RQ}$$

Assuming that the distance between Q and Q' is reduced indefinitely the two points will coincide and as such, the elasticity of demand at the point Q will be equal to $\frac{QP}{RQ}$

On a straight line demand curve we can make use of this formula to find out the price elasticity at any particular point. We can find out numerical elasticities also on different points of the demand curve with the help of the above formula. It should be remembered that the point elasticity of demand on a straight line is different at every point. Elasticity at any one point is the ratio of the lower part of the straight line demand curve, it is called point elasticity of demand.

7.6.3 Arc Method

The main drawback of the point method is that it is applicable only when we possess information about even the slight changes in the price and the quantity demanded of the commodity. But in practice, we do not possess such information about minute changes. We may possess demand schedules in which there are big gaps in price as well as the quantity demanded. In such cases, there is an alternative method known as arc method of elasticity measurement. In this method the mid-points between the old and the new data in the case of both price and quantity demanded are used. It studies a portion or a segment of the demand curve between the two points. An arc is a portion of a curve line, hence, a portion or segment of a damand curve. The formula for measuring arc elasticity is given below.

$$Ed = \frac{\text{Change in quantity demanded}}{\text{Original quantity plus new quantity demanded}} \div \frac{\text{Change in price}}{\text{Original price plus new price after change}}$$

Symbolically the formula may be expressed thus :

$$Ed = \frac{Q-Q1}{Q+Q1} \div \frac{P-P1}{P+P1}.$$

Here, Q = Original Quantity demanded,

Q1 = New Quantity after change in price,

P = Original Price, and

P1 = New price after change.

We can take a numerical example to illustrate arc elasticity. Suppose that the price of a commodity is Rs. 5 and the quantity demanded at that price is 100 units of a commodity. Now assume that the price of the commodity falls to Rs. 4 /- and the quantity demanded rises to 110 units. In terms of the above formula, arc elasticity, then, will be

$$Ed = \frac{100-110}{100+110} \div \frac{5-4}{5+4}$$

$$= \frac{-10}{210} \div \frac{1}{9}$$

$$= -\frac{9}{21}$$

$$= \frac{3}{7}$$

(The nagative sign here may be omitted)

Check Your Progress -5

9. How is total outlay method used to measure elasticity of demand ?

10. How do you utilize the point method in measuring elasticity of demand ?

11. Explain the arc method which measure elasticity of demand.

7.7 Summing Up

In the earlier unit we discussed the meaning of demand, its kinds and the law of demand. In continuation to that in this unit we have touched upon the aspects of elasticity of demand and its measurement. Three important elasticities of demand are discussed in detail. The price elasticity of demand explains the responsivenes of demand due to changes in price. Where as, the relationship between relative change in demand and proportionate change in income is explained by income elasticity of demand. Cross elasticity measures the responsiveness of demand for a commodity due to the change in the price of other related commodities.

Three methods pertaining to the measurement of elasticity of demand are discussed. How change in price affects the changes in the total expenditure is explained by the total outlay method. In the point method, a straight line demand curve joining the two points is used to measure elasticity of demand. The third method, i.e., arc method, studies a segment of the demand curve between the two points.

-Dr. N. Lingamurthy

7.8 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics

7.9 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is elasticity of demand ? Explain the kinds of elasticity of demand.
2. What is price elasticity of demand ? Explain the kinds of it with the help of diagrams.
3. What are the methods which measure elasticity of demand ? Explain them in brief.

II. Answer each of the following questions in about 15 lines.

1. What is income elasticity of demand ? What are its determinants?
2. Explain the cross elasticity of demand.
3. What are the basic determinants of price elasticity of demand.?
4. Describe the total outlay method in measuring elasticity.
5. What is the point method of measuring elasticity?

BLOCK - III

THEORY OF PRODUCTION

This block introduces the concepts of production, production function, total product, average product, marginal product, isoquant, isocost, MRTS, expansion path, returns to scale, economies of scale and supply. The law of variable proportions is dealt with in the Unit-8. The laws of returns to scale, the kinds of economies of scale and the law of supply are explained in Unit - 10.

This block has the following 3 units.

Unit - 8 : Concept of Production Function and the Law of Variable Proportions

Unit - 9 : Neo-Classical Production Function

Unit- 10 : Laws of Returns to Scale.

Unit - 8: Concept of Production Function and Law of Variable Proportions

Contents

8.0 Aims and Objectives

This unit provides the basic knowledge pertaining to the concepts of production and production function. It also explains the 'law of variable proportions'.

After reading the unit, you will be in a position to

* identify the meaning of production and production function,
* explain production function for a single product,
* diagrammatically present the law of variable proportions.

8.1 Meaning of Production

The term 'production' in economics strictly refers to the creation of those goods and services which have exchange value. It does not mean creation of matter, as matter can neither be created nor can it be destroyed. Hence , production merely implies the creation of utilities . Economic utilities are mainly created in three forms : (i) form utility, (ii) time utility and (iii) place utility . Prof. J.R. Hicks has given his own interpretation of the term 'production'. He defines production as "any activity whether physical or mental which is directed to the satisfaction of other people's wants through exchange". This definition comprises *three essentials* :

(i) No production is possible without some sort of activity, physical or mental. Thus, a lawyer is as much a producer as a farmer because his activity is mental in sharp contrast to the activity of the farmer which is physical in content.

(ii) The activity concerned must be directed to the satisfaction of other people's wants. Thus, if a farmer produces wheat for self-consumption, his activity will not be regarded as one of production.

(iii) Other people's wants must be satisfied through a process of exchange. Thus, if a teacher coaches students without receiving a salary of tuition fees in exchange, his services can not be regarded as production.

In a general sense, economists have characterised the production process as a combination of four factors of production, Viz., land, labour, capital and organisation. Land plays an important role in the agricultural sector, while other factors have prominence in the industrial sector. The entrepreneur, who looks after the organisational aspects of production is the decision- maker who, through a combination of the factors of production, produces the output. Hence the entrepreneur plays a key role in the production of a commodity. In the literature of economics also, entrepreneurship is often considered as playing a dominant role in initiating the process of development. Schumpeter considers entrepreneurship to be an important trait for the development process to take place in any economy, as an entrepreneur is often cosidered as an innovator. While the four factors of production are often recognised as being important for the production process, in recent times, there is a further sub-division of the activities. Hence the standard economic discussions of production classify the variables related to the decision of the firms into only two categories, inputs and outputs. An *input* is simply anything which the firm buys for use in its production or other process An *output* is any commodity which the firm produces or processes for sale.

Check Your Progress -1

1. What are the essential points in the definition of ...ks on production ?

2. What are the factors of production ?

3 What do you mean by the term 'pr... duc ion'.

8.2 The Concept of Production Function

The production function is a purely technical relation which connects factor inputs and outputs. Thus, the production function for any commodity is an equation, table or graph showing the quantity of the commodity that can be produced per unit of time for each of a set of alternative inputs, when the best of production techniques available are used. Thus, it describes the laws of proportion, that is the transformation of factor inputs into outputs during any particular time period. The production function may represent either the technology of a firm or an industry, or of the economy as a whole. It shows us how, and to what extent, output changes with variations in inputs during a specified period of time. As it expresses a functional relationship between quantities of inputs and outputs, it is named as production function. it can also be expressed in the form of a mathematical equation in which output is the dependent variable and inputs are the independent variables . The relation between the inputs used in the productive process and the quantity of output obtained can be expressed in functional notation which is as follows :

$$P = f(A,B,C,D).$$

Where 'P' stands for output of goods per unit of time and A,B,C,D, are the various inputs used for producing the output. The production function is always specified for a period of time. It is

a flow of inputs resulting in a flow of output during a specified period. Every producing firm has its own production function which is determined by the state of the technical knowledge and managerial ability of that firm. Improvement in technical knowledge or managerial ability of the firm will bring about a new production function in the place of the existing one. The new production function either gives more output with the same quantity of original inputs or it may use smaller quantities of inputs for the same original output.

Check Your Progress -2

4. What is production function ?

8.3 Assumptions of Production Function

The Production function is based on the following assumptions :

i) It is always related to a specified period of time.

ii) Technical knowledge is assumed to be constant.

iii) The firm in question will use the best and the most eficient technique available.

iv) The factors of production are divisible into viable units.

8.4 Production Function for a Single Product

For producing one commodity, several methods of production may be available. A method of production is a combination of factor input required for the production of one unit of output. For instance, a unit of commodity 'X' may be produced by the following processes :

	Process P1	Process P2	Process P3
Labour Units	2	3	1
Capital Units	3	2	4

The three activities or processes decribed above may be graphically presented by the length of lines from the origin to the point determined by the labour and capital units. These three processes can be shown as has been done in the figure 8.1.

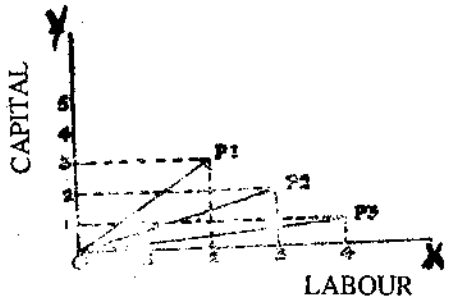


Fig-8.1

If there are two methods, namely A and B, to produce commodity 'X', method A is considered technically efficient in relation with the other method 'B', if 'A' uses at least one factor less than B. For example, the two methods A and B require the following factor inputs:

	A	B
Labour	2	3
Capital	3	3

In the above example , method 'A' is technically efficient when compared with method 'B'. The theory of production concentrates only on efficient methods of production. A rational entrepreneur always goes for efficient methods of production. We must note here that a technically efficient method is not necessairly economically eficient as there is a difference between technical and economic efficiency. For example, the following two methods are technically efficient and are included in the production function.

	A	B
Labour	2	1
Capital	3	4

In the two technically efficient methods described above, one of them will be chosen at any particular time depending on the price of factors of production. The choice of a technique is an economic one which is based on prices and not on its technical efficiency. The goal of the firm using a particular production function is profit maximisation that is the maximisation of the difference:

$\Pi = R - C$, where

Π = Profits,

R = Revenue, and

C = Cost.

Production function as determined by technical conditions of production is of two types:

1. Production function with one variable input is a short term production function.
2. Production function with all variable inputs is a longterm production function.

In the short - run, it is possible to increase the quantities of one input while keeping the quantities of other inputs constant in order to have more output. This aspect of production function is known as the *law of variable proportions*. In the long- run, it is possible for a firm to change all its inputs in order to expand its business. This is known as *'returns to scale'*. In this unit, let us deal with law of variable proportions. The discussion on returns to scale is dealt with in another unit.

8.5 The Law of Variable Proportions

The law is also called as production function with one variable input. According to this law, in the production function of a firm all the inputs are fixed except one. This one input is called the variable input. For example, let us assume that all the inputs such as plant, machinery, etc., of a firm are fixed but labour is made variable factor of production. Here, the firm tries of increase its output by increasing the supply of labour (other inputs being fixed). When the firm increases the supply of labour, it changes the proportions between the fixed and the variable inputs. This law is concerned with the way in which the output changes when the number of units of a variable input is increased, keeping other inputs constant. When more and more units of a variable factor are used, holding the quantities of fixed factors constant, a point is reached beyond which the marginal product, then the average product and finally total product will diminish. This can be illustrated with the help of a table by taking a 5 acre plot of land.

Table - 8.1 : Output of Rice (in Units) from Five Acre Land

Number of Labourers	Total Product	Average Product	Marginal Product	Stages
1	8	8	8	Stage — I
2	20	10	12	
3	36	12	16	
4	48	12	12	Stage — II
5	55	11	7	
6	60	10	5	
7	60	8.6	0	Stage — III
8	56	7	-4	

In the above table, production function is revealed in the first two columns. The average product and marginal product columns are derived from the total product column and number of labourers column.

8.5.1. Total Product (TP) : This refers to the total amount produced during a particular period by all the factors of production employed over that period of time. If all the inputs except one are held constant, the total product will vary according to the quantity of the variable factor used.

8.5.2. Average Product (AP) : This is measured by the total product per unit of the variable factor.

$$AP = \frac{TP}{L}, \text{ where}$$

AP = Average Product,

TP = Total Product, and

L = Labourers.

8.5.3. Marginal Product (MP) : This is the change in total product resulting from the use of one more unit of the variable factor.

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

An analysis of the above table shows that the total, average and marginal products first increase till they reach the maximum and then start declining. The total product reaches its maximum when 7 units of labour are used and then it declines. The average product continues to rise till the 4th unit while the marginal product reaches its maximum at the third unit of labour, then it also falls. It should be noted that the point of falling output is not the same for total, average and marginal products. The marginal product follows it and the total product is the last to fall. This means that the tendency of diminishing returns is ultimately found in the three productivity concepts. This is shown in the diagram 8.2.

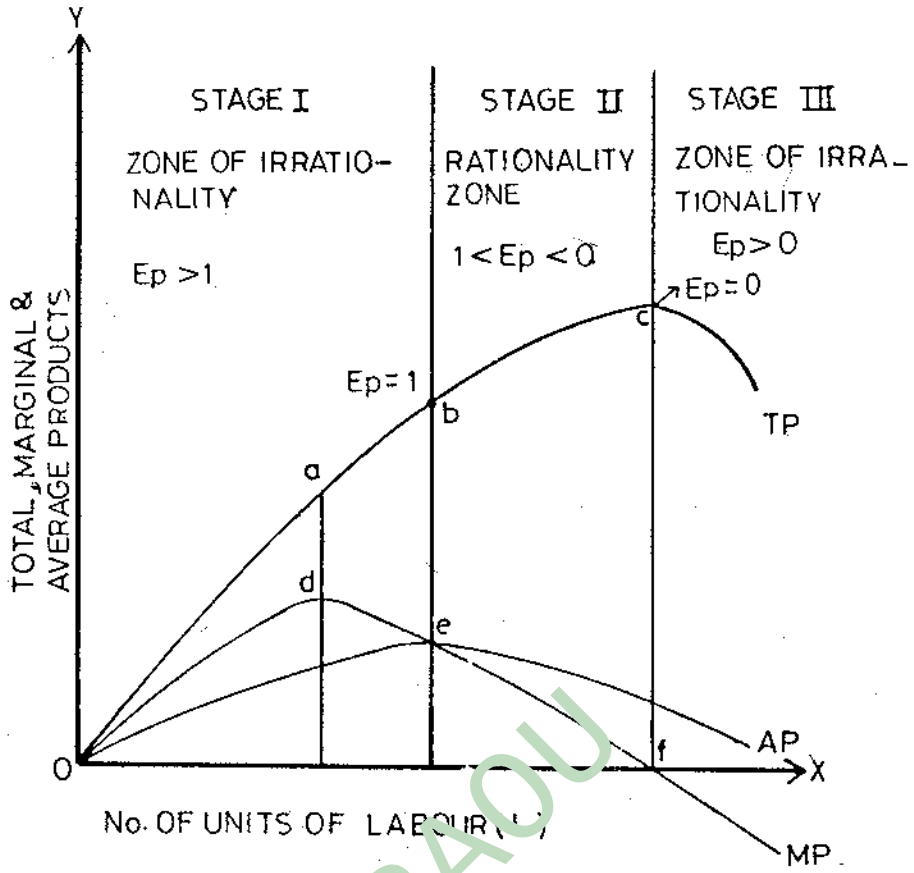


Fig -8.2 : Total, Average, Marginal Product Curves

In the diagram 8.2, the Total Product (TP) curve first rises at an increasing rate, but later moves gradually towards the hightest point, after reaching that point it starts falling slowly. This can be noticed by observing the slope of the TP curve. In the above diagram, at point 'a' the slope of TP is the highest, at 'b' it is less than 'a' and at 'c' it becomes zero. The Marginal Product Curve (MP) and the Average Product Curve (AP) also rise with TP. The MP curve reaches its maximum point at 'd' when the slope of the TP curve is at the maximum point at 'a' and then it starts falling. The maximum point on the 'AP' curve is where it coincides with the 'MP' curve. This point coincides at point 'e' with 'b' on the TP curve from where the total product starts a gradual rise. When the TP curve reaches is maximum point at 'c' the MP curve becomes zero at point 'f' and when the former starts declining, the latter becomes negative. When the total product becomes zero, then the average product also becomes zero. The rising, the falling and the negative phases of the total, marginal and average products are in fact the different stages of the Law of Variable Proportions.

In Stage -I, the total product increases at an increasing rate. One labourer produces 8 units while two labourers produce 20 units. In the first stage, the marginal as well as average products both rise, but the marginal product rises faster than the average product. Because the marginal product is greater than the average product, the former pulls up the latter. When the marginal product begins to decline, it still exceeds the average product and tends to pull up the latter. When both marginal and average products are equal, the marginal product neither pulls-up nor pulls-down the average product. Here Stage -I ends and Stage-II begins.

In Stage-II, the total product continues to increase no doubt but at a diminishing rate, till it reaches the maximum point at 'c' . The boundary for the second stage is at the point 'c' where the total product is maximum and marginal product is zero. In Stage-II, the marginal product and the average product both decline but the marginal proudct declines at a faster rate than the average product. The marginal product being lower than the average product pulls the average product down.

Stage-III begins when the MP curve meets the X-axis and the TP curve reaches its maximum point. In this stage any increase in the number of labourers on the farm causes the total product to decline. The marginal product now becomes negative and the average product continues to decline though it remains positive. As the marginal product becomes negative in this stage, no firm would be liberately choose to operate in it.

A rational enterpreneur is expected to maximize his profits. Since profit maximization is his goal, as long as he produces in Stage-I, he is irrational as he can still increase the factor of production under consideration and make more profits. Hence Stage-I is a zone of irrationality. The elasticity of production, which is defined as the ratio of marginal product to average product, is greater than one in this Zone. Stage-II is a Zone of rationality, as the entrepreneur can maximize his profits. The elasticity of production here will be between one and zero. In this stage the marginal product curve touches the X-axis and the value of marginal product becomes zero. As long as the elasticity of production lies in between one and zero the enterpreneur is producing in a Zone of rationality. Once the marginal product becomes negative, that is as elasticity of production becomes less than zero, as it is shown in the diagram in Stage III, the entrepreneur, if he is rational, will not increase production by increasing the variable factor beyond the point wher its marginal product becomes zero. If he chooses to increase the factor of production under consideration, he will not be maximizing his profits, even though his output may be increasing at a decreasing rate.

Check Your Progress - 3

5. *Explain the terms : total product, average product and marginal product.*
6. *Depict diagram showing law of variable proportions.*
7. *In the above diagram, how do you explain the three stages ?*

8.6 Summing Up

In the last Block we discussed about the consumer theory, In this block we are examining the theories relating to production and the producer. This unit has touched upon the aspects of production and production function. By production, we mean the creation of utilities. Production is the result of some sort of activity. It provides satisfaction and enables exachange.

Production function explains the technical relationship between inputs and output. It enables us to know different methods to produce a commodity. Production of a commodity can be increased by increasing either one input or more inputs. Major part of this unit is devoted to explain the law of variable proportions. It indicates that by keeping all other factors constant, production can be

changed by increasing one input which we term as variable input. The law says that if we increase one input, ouput will increase upto a stage then it falls. The point of falling output is not the same for total, average and marginal products. The figure 8.2 gives you a clear picture regarding the law of variable proportions..

- Dr. N. Lingamurthy

8.7 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics / Principles of Economics

8.8 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is meant by production ? Explain the concept of production function by taking a single product.
2. Explain the law of variable proportions.

II. Answer each of the following questions in about 15 lines.

1. What is production ? What are its essential points ?
2. What is meant by production function ? What are its assumptions ?
3. Explain the following terms : total product, average product and marginal product.

Unit - 9 : Neo-Classical Production Function

Contents

9.0 Aims and Objectives

The purpose of this unit is to explain the theory of neo-classical production function in brief with the help of isoquants and isocosts.

After reading the unit, you will be able to

* define the terminology used in the theory of production function, such as, isoquants, isocosts, marginal rate of technical substitution, expansion path, and
* derive producer's equilibrium.

9.1 Introduction

The notion of production function in economic theory is a micro-economic one. As noted earlier, it represents the range of technologically possible alternative combinations of inputs and output that an individual firm may realise. Based on the theoretical formulation of the production function, empirical studies have been conducted and the concept of production function has acquired greater importance in the last three decades.

The production function usually involves, as independent variables, measures of labour and capital for a single factory or firm. It may also involve as independent variables all other inputs but, the greater part of the literature is concerned only with labour and capital as inputs.

As discussed in an earlier chapter, a combination of labour and capital as two inputs for

providing output of a certain commodity may involve different methods of production. The choice of any technique depends on various economic factors, though technical efficiency is another guiding factor. In this regard, the concept of isoquant is important for understanding the process of production.

9.2 Notion of Isoquant

An isoquant is *the locus of all technicall efficient methods, or all the combinations of factors of production for providing a given level of output.* The production isoquant may assume various slopes depending on the degree of substitution of factors.

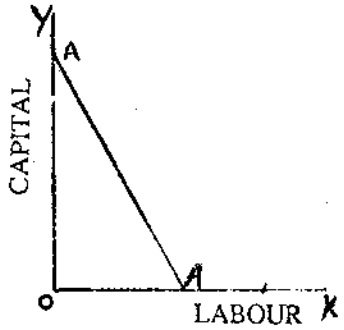


Fig. - 9.1 : Linear Isoquant

Linear Isoquant : This isoquant assumes perfect substitutability of factors of production. A given commodity may be produced by using only capital, or only labour or by an infinite comibination of K and L. For example, a commodity may require Rs. 10,000 as capital for its production or 100 labour or a combination of both, where labour may be substituted by capital or vice-cersa. (see graph 9.1).

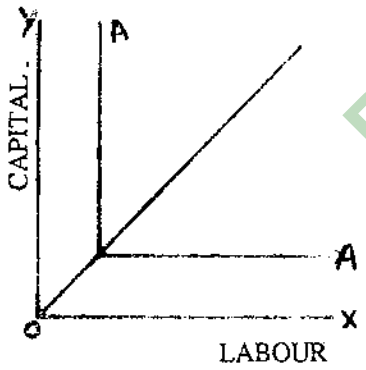


Fig. - 9.2 : Input-Output Isoquant

Input - Output Isoquant : This assumes strict complementarity that is zero substitutability of the factors of production. There is only one method of production for any one commodity. This type of isoquant is also called **Leontief Isoquant** after Leontief who invented the input -output analysis. Suppose for example, that in order to produce commodity A (say a computer), we have only one method where we use capital alone, or to produce commodity B (say a beedi) we have only one method where we use labour alone, then , if we encounter non-substitutability of factors of production in either of the above cases, the input -output isoquant of the Leontief type would be used.(see diagram 9.2)

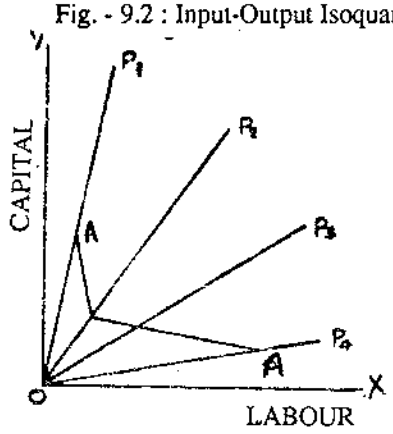


Fig. - 9.3 : Kinked Isoquant

Kinked Isoquant : This assumes limited substitutability of K and L. There are only a few processes for producing any one commodity. Substitutability of the factors is possible only at the kinks. This form is also called **activity analysis-isoquant or linear programming isoquant,** because it is basically used in linear programming See fig.9.3.

For example, in paddy cultivation, bullock labour can be replacd by tractor for ploughing operations, but for transplantation work, the substitutability between labour and

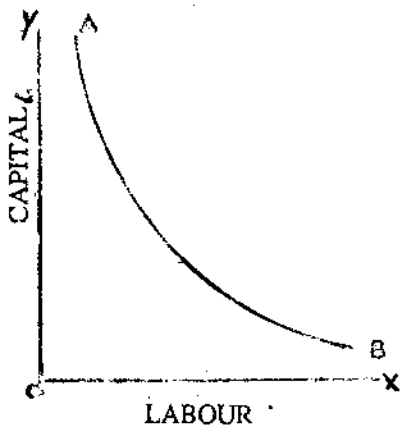


Fig-9.4 : Smooth Convex-Isoquant

capital is limited, as this work has to be done entirely by labour.

Smooth Convex Isoquant : In this type of isoquant, continuous substitutability of K and L only, over a certain range, is assured, beyond which factors cannot substitute each other. The isoquant appears as a smooth curve convex to the origin. See figure 9.4.

For example , a tractor with a few labourers or a number of ploughs with more labourers can be used for seedbed preparation, where cultivation by the plough is a more labour-using method of cultivation, while tractor cultivation is a more capital-using method of cultivation. Both the methods can yield the same output.

An isoquant shows the different combinations of labour and capital with which a firm can produce a specific quantity of output. A higher isoquant refers to a greater quantity of output and a lower one to a smaller quantity of output.

Example

Isoquant-I		Isoquant-II		Isoquant-III	
Labour	Capital	Labour	Capital	Labour	Capital
2	11	4	14	6	15
1	8	3	10	5	12
2	5	4	8	6	9
3	3	5	5	7	7
4	2.5	6	4	8	6
5	0.2	7	3.5	9	5
6	1.5	8	3.0	10	5
7	1.2	9	3.5	11	5.5

Plotting these points on the same set of axes and connecting them by smooth curves we get three isoquats as shown in Figure 9.5.

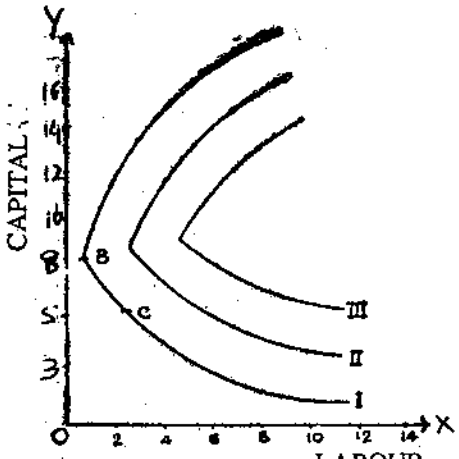


Fig-9.5

The firm can produce the output specified by isoquant - I by using 8K and 1L (point B) or by using 5K and 2L (Point C) on isoquant - I Isoquants, as mentioned above, specify cardinal measures of output. For example, isoquant-I might refer to 60 units of physical output, isoquant-II 100 units of output.

9.3 Properties of Isoquants

Isoquants have the same characterisites as indifference curves. They are:

1. They have a negative slope.
2. If one isoquant -II lies above and to the right of another isoquant-III, then -III will normally correspond to a higher output level than -II
3. No two isoquants intersect each other.
4. The isoquants are convex to the origin.

The rationale of each of these properties is closely analogous with that involved in the theory of the consumer, except for one feature that arises in isoquant. A consumer's as indifference curve can be defined as a line of constant utility. But since the entire idea of utility measurement is under suspicion, the utility level represented by each indifference curve cannot be exactly specified with the help of numbers. In the case of isoquants the output level is a meaningful concept and the curves can be labelled as 5,10,15, etc.

In the case of convex isoquant, two factors of production, namely, capital and labour were shown on the OY-axis and OX-axis respectively and the production indifference curve shows here that whatever be the combination of capital and labour, it yields the same output as long as the same isoquant is considered.

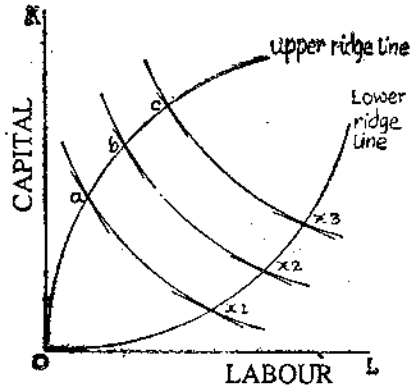


Fig-9.6

In figure 9.6 the production function is depicted in the form of a set of isoquants. By construction, the higher to the right an isoquant, the higher the level of output it depicts. In the diagram 9.6 of production function, the efficient ranges of output have been depicted. The upper ridge line implies that the marginal product of capital is zero. The lower ridge line implies that the marginal product of labour is zero. Production techniques are only technically efficient inside the ridge lines. Outside the ridge lines the marginal products of factors are negative and the methods of production are inefficient, since they require a greater quantity of both factors for producing a given level of output. Inefficient methods of production are not considered by the theory of production as they imply irrational behaviour of the firm.

Check Your Progress-1

1. What is isoquant ?

2. Depict the smooth convex isoquant on a graph .

3. List the properties of isoquants ?

9.4 The Marginal Rate of Technical Substitution

The marginal rate of technical substitution or the marginal rate of substitution (MRS) refers to the amount of K that a firm can give up by increasing the amount of L used by one unit and still remain on the same isoquant. The MRS is equal to marginal product of labour divided by the marginal product of capital. As the firm moves down on an isoquant the MRS diminishes.

For example , in the production function diagram, if we are moving from point B to point C, on isoquant I, the firm gives up 3 units of K for one additional unit of L. Thus, the $MRTS_{LK}$ (Marginal rate of substitution of L for K) = 3. Simalary, from point C to point D on isoquant - I, the MRTS =2. Thus, the $MRTS_{LK}$ dimishes as the firm moves down on an isoquant. This is so because, the less K and the more L the firm is using (i.e., the lower the point on the isoquant) the more difficult becomes for the firm to substitute L for K in production.

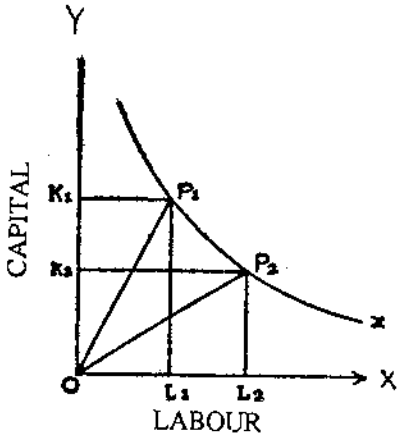


Fig-9.7

The factor intensity of any process is measured by the slope of the line through the origin representing the particular process. Thus, the factor intensity is the capital-labour ratio.

In the figure 9.7 process P_1 is more capital - intense than process P_2.

$$\frac{K_1}{L_1} > \frac{K_2}{L_2}$$

The upper part of the isoquant includes more capital- intensive process. The lower part of the isoquant includes more labour-intensive techniques :

Check Your Progress - 2

4. Explain the concept of marginal rate of technical substitution .

5. What is factor intensity ?

6. In the diagram 9.7 which process is less capital-intensive ?

9.5 Isocosts

An isocost line shows *all difficult combinations of labour and capital that a firm can purchase, given the total outlay of the firm and factor prices.* The slope of an isocost is given by - P_L / P_K, where P_L refers to the price of labour and P_k to the price of capital.

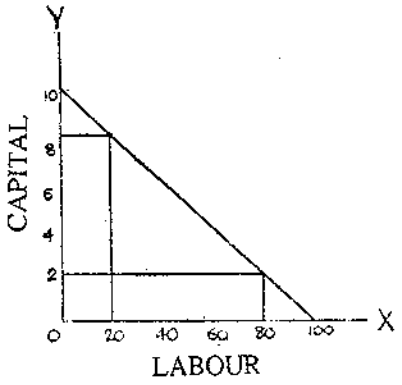


Fig-9.8

If the firm spent all of its outlay on its outlay on capital, it could purchase total outlay /P_K units of capital. If the firm spent all of its total outlay on labour, it could purchase total outlay/P_L units of labour. In the diagram 9.8 let us measure units of capital on OY-axis and units of labour on OX-axis. We get one point on OY-axis and another on OX axis. Joining these two points by straicht line, we get the isocost of the firm. The firm can purchase any combination of labour and capital shown on its isocost line. For example, if Rs. 1,000 is the total outlay and if a farmer decides to purchase ploughgs only for Rs. 100 he can purchae ten ploughs. Similary if he decides to spend Rs. 1000 for hiring labour he may hire 100 labourers, asuming the price of labour to be Rs. 10. But if he combines both capital and labour , he may have various combinations of labour and capital which are depicted on the isocost line, where the cost would be Rs. 1000 for any combination on that line.

Check Your Progress -3

7. Explain the meaning of isocost.

8. Show the isocost line on a graph.

9.6 Producer's Equilibrium

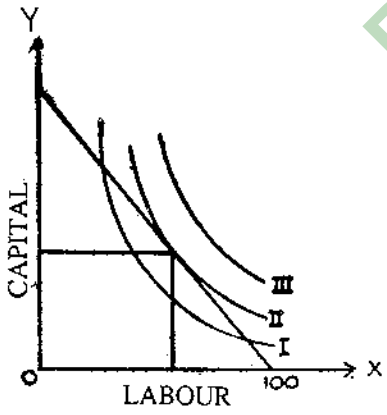


Fig-9.9

A producer is in equilibrium when he maximizes output for his given total outlay. This means that producer is in equilibrium when he reaches the highest isoquant, given the isocost. This occurs when an isoquant is at a tangent to the isocost. At equilibrium , $MRTS_{LK} = P_L / P_K$. Or the marginal rate of substitution is defined as the ratio of marginal product of labour to marginal product of capital.It must be equal to the ratio of price of labour to price of capital.

$$\frac{MP_L}{MP_K} = \frac{P_L}{P_K} \quad \text{or} \quad \frac{MP_L}{P_L} = \frac{MP_K}{P_K}$$

This means that at equilibrium the marginal product of the last rupee spent on labour is the marginal product of the last rupee spent on capital. This can be illustrated as in the figure 9.9.

If the isoquants and isocost line are drawn with reference to the same axes, we can determine the point of equilibrium. This is given by point N in the above diagram. The firm cannot reach isoquant -III with its isocost as shown in the above diagram. If the firm produced along isoquant-I, it would not be maximising output. Isoquant-II is the highest isoquant that the firm can reach with its isocost.

Check Your Progress-4

9. How does a producer get equlibrium ?

9.7 Expansion Path

If the firm changes its total outlay, while the prices of labour and capital remain constant, the firm's isocost shifts parallel to itself. It will move up if total outlay is increased and move down if total outlay is decreased. These different isocosts will be at a tangent to different isoquants, thus defining different equilibrium points for the producer. By joining these points of the producer equilibrium, we get the firm's *expansion path* . This is analogous to income-consumption curve discussed in indifference curve analysis.

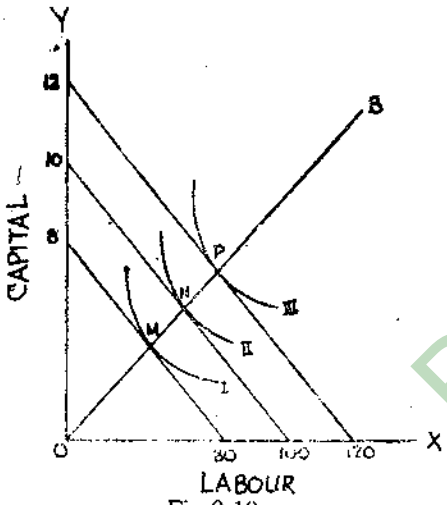


Fig-9.10

Suppose the price of the plough and the price of labour remain unchanged at Rs. 100 and Rs. 10 respectively. But the total outlay can be either Rs. 800 or Rs.1,000 or Rs.1,200. The first isocost line is drawn for a total outlay of Rs. 800, the second one for a total outlay of Rs. 1,000 and the third one for a total outlay of Rs. 1,200. The first isocost line is tangential to the isoquent -I at point M, the second isocost line is tangential to isoquant-II at point N and the third isocost line is tangential to isoquant-III at point P. Joining the points OMNP, we get the expansion path of the firm. The firm can increase its output along this path under the assumption that prices of labour and capital remain unchanged. In the above diagram, the expansion path is a straight line through the origin. This means that as output is expanded, the K/L ratio remains the same. In such a case, the ridge lines also will be straight lines.

Check Your Progress -5

10. What is expansion Path ?

9.8 Summing Up

In the last unit you were taught about the concept of production function and also the law of variable proportions. This unit has discussed the production function from the angle of neo-classicals. The notions of isoquant and isocost are explained. By using these concepts and the concept of marginal rate of technical substitution, producer's equilibrium is derived. In the last part, expansion path is shown. In a way, the process of producers' equilibrium resembles indifference curve analysis.

An isoquant shows the different combinations of factors of production with which a firm can produce a level of output. Like indifference curves, the isoquants have similar properties, such as, they should have negative slope and be convex to origin. When the total outlay of a firm and the prices of factors of production are given, an isocost line shows different combinations of factors of production that a firm can purchase. A producer gets equilibrium when two conditions are fulfilled. **First,** marginal rate of technical substitution should be equal to the ratio of factor prices. And, **secondly** the isoquant curve should be convex to the origion. At his given outlay, the producer should maximize his output.

-Dr. N. Lingamurthy

9.9 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.S. Agarwal : Micro Economics /Principles of Economics.

9.10 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the expansion path of a firm and the importance of it in production function analysis.
2. What is meant by isoquant ? Explain its properties.

II. Answer each of the following questions in about 15 lines.

1. Explain the marginal rate of technical substitution.
2. Explain isocosts with the help of a graph.
3. How does a producer get equilibrium ?
4. What is expansion path ? Explain diagrammatically.

Unit - 10 : Laws of Returns to Scale

Contents

10.0 Aims and Objectives

The purpose of this unit is to analyse the laws of returns to scale and the concepts of economies of scale, law of supply and elasticity of supply.

After reading the unit, you will be able to explain

* The laws of returns to scale,
* economies of scale,
* law of supply, and
* elasticity of supply.

10.1 Laws of Returns to Scale

10.1.1 Concept

Expansion of output may be achieved by varying some inputs only, but in the long-run, expansion in output can be achieved by changing all factors of production. The 'laws of returns to scale ' refer to the effects of scale relationships. Output may be increased in the long-run by changing all factors of production either by the same proportion or by different proportions. The term " returns to scale " refers to changes in output as all factors change by the same proportion. 'Returns to scale' are only one part of the economies of the scale. Returns to scale are technical while economies of scale include the technical as well as the monetary economies. In other words, this concept deals with the behaviour of output in response to change in the scale of production. An increase in the scale of production implies that all inputs or factors are increased in the same proportion. Here the factor proportions do not change when the scale of production changes. The study of change in output as a result of changes in the scale constitutes the subject-matter of 'returns to scale'.

10.1.2 Assumptions

The laws of returns to scale assume that :

i) All factors are variable.
ii) A worker works with given tools and implements.
iii) Technological changes are absent.
iv) Perfect competition prevails.
v) The output is measured in physical quantities.

Under the above assumptions, when all inputs are increased in unchanged proportions and the scale of production is expanded the effect on output shows three stages. In the **first stage**, returns of scale increase because the increase in total output is more than proportional to the increase in all inputs. In the **second stage**, returns to scale will become constant as the increase in total output is in exact proportion to the increase in inputs . In the **third stage**, returns to scale diminish because the increase in output is less than proportionate to the increae in inputs. In other words, if we increase all the inputs by 10 per cent at a time , then this total output will increase by more than 10 per cent in the first stage, by 10 per cent in the second stage and by less than 10 percent in the third stage. The principle of returns to scale can also be explained with the help of the following table.

Table : Returns to Scale in Physical Units

Unit	Scale of Production	Total Returns (In Quantities)	Marginal Returns	
1.	1 worker + 1 acre land	8	8	Increasing Returns to Scale
2.	2 „ + 2 „	17	9	
3.	3 „ + 3 „	27	10	
4.	4 „ + 4 „	38	11	Constant Returns to Scale
5.	5 „ + 5 „	49	11	
6.	6 „ + 6 „	59	10	Diminishing Returns to Scale
7.	7 „ + 7 „	68	9	
8.	8 „ + 8 „	76	8	

The above table reveals to us the fact that in the beginning with the scale of production of 1 worker + 1 acre of land, the total output is 8 quintals. When the scale of production is doubled (2 workers + 2 acres of land), total returns are more than doubled as the production increase to 17 quintals. If we still increase the scale of production to (3 workers + 3 acres land), the total returns increase to 27 quintals. This is called the stage of increasing returns to scale. As the scale of production is further expanded, the total returns will increase in such a way that the marginal returns become constant. In the case of the 4th and 5th units of the scale of production, marginal returnts remain constant at 11 quintals. It means due to increase in the inputs, there is no additional increase in the returns. This is the stage of constant returns to scale. Any increase in the scale of production beyond this will lead to diminishing returns. In the case of the 6th, 7th and 8th units, the total returns increase at a lower rate than before so that the marginal returns start diminishing successively to 10,9 and 8. This is the stage of diminishing returns to scale. This phenomenon can also be shown in the form of a diagram.

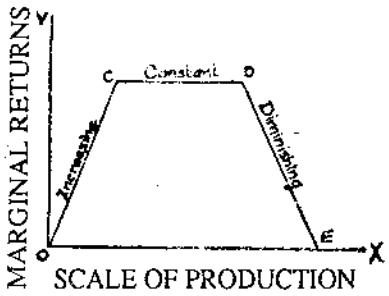


Fig-10.1

In the diagram 10.1 the OCDE curve represents returns to scale. From O to C, due to the increase in the scale of production, the returns to scale are shown as increasing. From point C to D, the returns are constant and from D to E they are diminishing. Now let us try to understand why the returns to scale first increase, then remain constant and then diminish. Let us analyse each of the laws of return.

10.1.3 Increasing Returns to Scale

Returns to scale increase because of the indivisibility of factors of production. This means that the machines, management, labour, finance, etc., cannot be divided into smaller sizes to suit the requirements of a producing firm. When a firm expands its size, the returns to scale increase because the indivisible factors are employed to their maximum capacity. As the concept of indivisibility is vague, modern economists attribute increasing returns to economies of scale and specialisation. When a firm expands its size, there is a wide scope for specialisation of labour, management and machinery. Work is divided into several processes and sub-processes for better concentration to increase efficiency. Thus, with specialisation and efficiency, output increases when the size of the firm is expanded. It enjoys both internal and external economies of scale of production. The firm may be able to instal better machines, sell its goods more easily, borrow money cheaply, get the raw-materials cheaply as it purchases in larger quantities and employ more efficient managers and workers, etc. Further, it may also enjoy external economies in terms of cheap credit, and transport due to the concentration of a number of firms at one place. Trade journal, research and training centre appear which help in increasing the productive efficiency. All these help in increasing returns to scale.

10.1.4. Constant Returns to Scale

Increasing returns to scale accrue to a firm or industry only upto a point. As the firm is enlarged further, internal and external economies are counter balanced by diseconomies of scale.

When economies and diseconomies balance each other, output increases in the same proportion as an increase in the proportion of inputs . Hence, constant returns to scale occur. This means that if all the inputs are doubled, output also doubles. A production function showing constant returns to scale is called linear and homogeneous production function or homogeneous production function of the first degree. The Cobb-Douglas production function evolved by the American Economists is a linear homogeneous production function.

10.1.5 Diminishing Returns to Scale

If a producing firm continues to expand even beyond the point of constant returns, a stage comes when diminishing returns to scale set in. The business may become unwieldy and it brings problems of supervision and coordination. Diseconomies of scale dominate economies of scale. Diseconomies may arise either due to higher factor prices or from diminising factor productivities. When an industry expands its size, the demand for skilled labour, land, capital etc., rises and under the conditions of perfect competition, intensive bidding raise wages, rent and interest. The prices of raw materials may also grow and there may be frequent break downs of machinery due to the difficulties involved in controlling them.

Returns to scale can also be represented with the help of isoquants. The diagram given below depicts the increasing, constant and diminishing returns to scale.

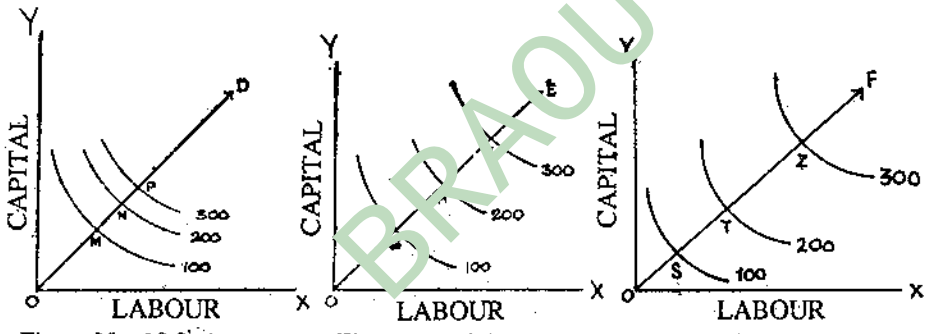


Figure No. 10.2 A Figure No.10.2 B Figure No. 10.2 C

Diagram -A illustrates increasing returns to scale. Here an increase in both inputs in a given proportion brings a more than proportionate increase in output. Thus 'OM' is greater than 'MN' and 'MN' is greater than NP. If the factor price ratio P_L/P_K remains unchanged, output expands along ray OD.

Diagram-B illustrates constant returns to scale. It shows that when we double both inputs, we double output . If we triple all inputs, the output level is also tripled. Thus OG = GH = HI. The output expands along ray OE as long as P_L/P_K remains unchanged.

Diagram -C depicts diminishing returns to scale. Here, to double the output per unit of time, the firm must more than double the quantity of both inputs used per unit of time' . Thus here OS is less than ST and ST is less than TZ.

Check Your Progress -1

1. *What do you understnad by the term 'returns to scale' ?*
2. *How does returns to scale differ with economies of scale ?*
3. *List the assumptions on which laws of returns to scale depend.*
4. *Explain the stages of increasing, constant and diminishing returns to scale.*

10.2. Economies of Scale

10.2.1 Concept

A firm or an industry increases its size to advantage of the benefits of large-scale production. After the Industrial Revolution, it has become possible to introduce machinery on a large scale to expand output. The reason for this development has been mainly to take advantage of some of the economies associated with large scale production. *Economies of scale* are nothing but the reduction in production in costs accured to a firm or an industry either due to its internal expansion or due to the concentration of a large number of firms at one place.

10.2.2 Kinds of Economies of Scale

Economies of scale may be of two kinds :

i) Internal Economies, and

ii) External Economies.

i) Internal Economies

They are those which accrue to the firm itself when the firm expands its output. hence, internal economies arise within a firm as a result of its own expansion. In other words, they arise simply due to the increase in the scale of production. These economies are enjoyed because of the use of methods which small firms do not find it worthwhile to employ. The following are the various types of internal economies.

1. Technical Economies : They may arise in the following ways :

a) Due to the adoption of better techniques of production .
b) Due to the purchase of bigger machines at economical prices .
c) Due to the linking up of various processes and form specialization.

2. Managerial Economies : These economies arise from the creation of special departments or functional specialisation.

3. Commercial Economies : These economies arise from the purchase of materials and the selling of goods. Large business firms enjoy bargaining advantages as they are given preferential treatment in their business.

4. Financial Economies : These advantages arise from the fact that a big firm has better credit and can borrow at more favourable rates.

5. Risk - bearing Economies : A big firm can spread its risks and it will have the capacity to bear them by diversifying its output. Diversification may be in terms of sources of supply of raw-materials and of the process of manufacture.

ii) External Economies

External economies are associated with localisation of industry. They occur where an increase in the size of an industry leads to lower costs for each individual firm in the industry. They accrue to each member firm as a result of the expansion of the industry as a whole. The following are the various types of external economies.

1. Economies of Concentration : They relate to the advantage arising from the availability of skilled workers, the provision of better transport and credit facilities, benefits from subsidiary industries, etc. Scattered firms of an industry cannot enjoy such benefits.

2. Economies of Information : They arise due to the publication of trade journals, magazines and establishment of research centres.

3. Economies of Disintengration : When an industry expands its size, it becomes possible to split up some of the processes which are taken over by specialist firms. For example, a number of cotton mills located in a particular locality may have the benefit of a calendering plant.

Check Your Progress -2

5. *How do you explain the term 'economies of scale' ?*
6. *What are the important internal economies ?*
7. *List the external economies.*

10.3 Law of Supply - Its Exceptions

By the term 'suply' we mean the quantities of a commodity that a seller is willing and able to offer for sale. If the price goes up, the producer will offer more for sale. But if the price goes down, he will be unwilling to sell and will offer less to sell. Hence, supply varies with a change in price and supply is always made at a price. Just as demand implies willingness and ability to pay, *supply implies willingness and ability to deliver the goods.* There is a difference between the terms 'stock' and 'supply'. Stock constitutes potential supply. But supply means the quantity actually offered for sale at a certain price. Stock is the total quantity which can be offered for sale if the conditions are favourable.

10.3.1 Factors Influencing Supply

The suply of a commodity depends upon the following factors:

1. The price of the commodity,
2. Prices of al other commodities.
3. Prices of the factors of production.
4. The state of the technology.

10.3.2 Supply Schedule

A supply schedule is a statement of the various quantities of a given commodity, offered for sale at various prices at a particular point of time. The following table shows a hypothetical supply schedule for mangoes.

Table : Supply Schedule

Price per Kg. (In Rs.)	Quantity Supplied (In Kgs.)
5	400
4	300
3	200
2	100
1	50

In the above schedule we notice that as the price falls, less mangoes are offered for sale and as price rises, the seller is prepared to sell more of them. The simple explanation here is that the higher the price of the commodity, the greater are the profits that can be earned and, thus, the greater the incentive to produce the commodity and offer it for sale.

10.3.3 Supply Curve

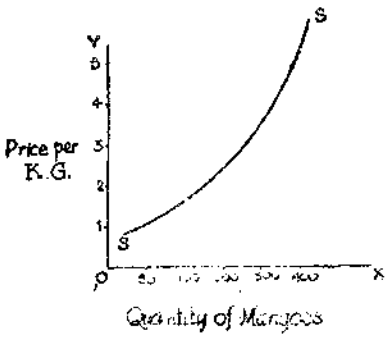


Fig-10.3

The above supply schedule can be represented in the form of a curve as illustrated in the diagram 10.3.

The quantities of mangoes offered for sale are measured along the 'OX' axis and the price along the 'OY' axis. The supply curve 'SS' slopes upwards as we go from the left to the right. This means that as the price rises, more is being offered for sale and vice-versa. This supply curve is related to the cost structure of the firm.

10.3.4 Law of Supply

From a study of the supply schedule and supply curve, we can formulate the law of supply as fallows :

"In a given market at any given time, the quantity of any good which people are ready to offer for sale generally varies directly with the price".

Here "varies directly" means that as price rises the quantity offered increases, and as it falls the quantity offered decreases.

10.3.5 Exceptions

There are, however, certain exceptions to the law of supply. They are :

1. When prices are expected to fall greatly, sellers sell more in order to clear their stocks. This happens in the short run.
2. In the long-run, the supply is influenced by changes in costs which are in turn affected by changes in technology.
3. Changes in habits, tastes, fashions, weather, etc, also affect the supplies of commodities.

Check Your Progress -3

8. What is supply ? How is it related to price ?

9. List the determinant factors of supply.

10. What is 'law of supply' ?

10.4 Elasticity of Supply

It is the degree of responsivenes or sensitiveness of the supply to changes in price. In other words, it can be difined as the percentage change in quantity supplied divided by the percentage change in price. Elasticity of supply can be measured with the help of the following formula :

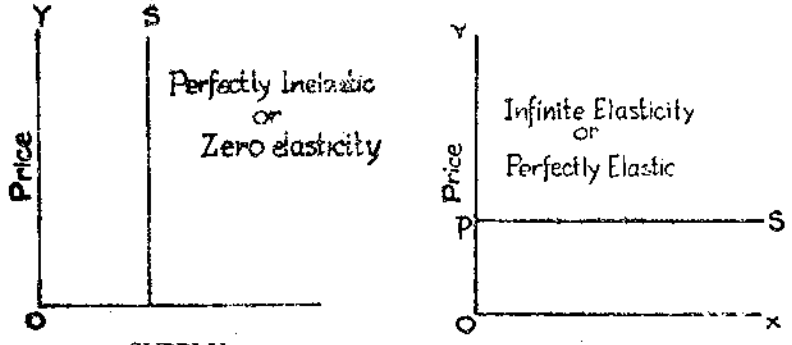
$$Es = \frac{\text{Change in amount supplied}}{\text{Original amount supplied}} \div \frac{\text{Change in price}}{\text{Original price}}$$

$$= \frac{\Delta Q}{Q} + \frac{\Delta P}{P}$$

Where 'Q' refers to the quantity supplied and 'P' to the price and 'Δ' represents a change. The supply is elastic when with a small change in price there is a great change in supply. It is inelastic or less elastic when a great change in price induces only a slight change in supply. If the supply is perfectly inelastic, it will be represented by a vertical line as shown below :

This diagram 10.4 represents the case of zero elasticity in which the quantity supplied does not change as price changes. If supply is perfectly elastic it will be represented by a horizontal straight line as in figure 10.5. At 'OP' price the supply elasticity is infinite because nothing at all is supplied at the lower prices. Producers would supply any quantity demanded at the price.

Normally, elasticity of supply is neither zero nor infinite. It lies between these to extreme limits.



SUPPLY

Fig-10.4

SUPPLY

Fig-10.5

Check Your Progresss -4

11. Explain the term 'elasticity of supply'.

10.5 Summing Up

This unit has discussed the laws of returns to scale and different economies of scale. Laws of returns to scale explain the changes in output when all factors of production move in the same direction and with equal proportion. You have found three types of returns to scale. First, when firm increases factors of production by the same proportion, output will increase much more than the increase in inputs which is termed as increasing returns to scale. In the next stage constant returns prevail. If the firm still increases the use of factors of production, it gets diminishing returns to scale.

Due to internal expansion or concentration of firms at one place, firm may get economies of scale. Economies indicate the reduction of costs to produce same quantity.

In the next part, positive relationship between price and supply is explained by law of supply. Degree of responsiveness of supply to the changes in price is analysed in elasticity of supply.

– Dr. N. Lingamurthy

10.6 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. H.s. Agarwal : Micro Economics/ Principles of Economics

10.7 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the laws of returns to scale.
2. What is meant by elasticity of supply ? What are its kinds ?
3. Explain the two kinds of economies of scale.

II. Answer each of the following questions in about 15 lines.

1. What is meant by economies of scale ? And what are the internal econmies of scale?
2. Define the law of supply and specify its exceptions.
3. What is elasticity of supply ?
4. What is supply ? what are the factors which determine supply ?
5. Explain the external economies of scale.

BLOCK - IV

COST AND REVENUE ANALYSIS

To understand the process of price determination and the forces behind demand and supply, one must have the knowledge of the nature of costs and revenue. This block concentrates on these two aspects. Different kinds of costs and revenue are explained in the following units. Diagrammatic explanation of different costs is done in Unit - 11. Revenue curves in different market situations are drawn in Unit - 12. You will be knowing the relationship between average and marginal cost, and among average revenue, marginal revenue and elasticity of demand in this block. Unit - 13 deals with the concept and objectives of firm. It also discusses in detail the equilibrium of the firm from two points of view : total cost - total revenue approach and marginal cost - marginal revenue approach.

This block contains the following 3 units :

Unit - 11 : Cost Analysis
Unit - 12 : Revenue Analysis
Unit - 13 : Equilibrium of the Firm

Unit-11 : Cost Analysis

Contents

11.0 Aims and Objectives

The main aim of this unit is to explain different concepts pertaining to cost analysis and the relationship among those costs.

After reading this unit, you will be able to

* analyse the contrast between explicit and implict costs,
* detect the diffierence between explicit and implicit costs,
* define opportunity costs,
* explain the nature of costs in short-run and long-run,
* recognize the meanings of fixed cost, variable cost, total cost, average cost, and marginal cost,
* distinguish the relationship between average cost and marginal cost, and
* diagrammatically analyse the short-run and long-run cost curves.

11.1 Introduction

Commodities are produced to satisfy human wants. Producing commodities means creating utilities, the aim of which is ultimately to fulfill human desires. The factors of production or various inputs have to be employed to produce any commodity. This is the physical side of production. The remuneration paid to a factor of production employed in the process of production is called the cost of production. The costs of a firm determine its supply of commodities. Supply and demand determine price. To understand the process of price determination and the forces behind supply, one must understand the nature of costs.

Costs may be termed as real costs, money costs, opportunity costs or alternative costs and explicit and implicit costs.

Check Your Progress-1

1. What is cost of production ?

11.2 Nature of Costs

Costs of production are generally incurred by a firm. These costs of production are money expenses for buying resources such as raw materials, machinery and equipment, depreciation and obsolescene charges on machines, buildings and other capital goods, rent on buildings, interest on capital invested and borrowed, normal profits of business, expenses on power, etc.

11.3 Kinds of Costs

11.3.1 Explicit and Implicit Costs

Explicit Costs : The expenses which are incurred by a firm in buying goods and services directly are termed as explicit costs. Money expenses made by the producer to hire workers and to purchase raw-materials, power,etc., are also explicit costs.

Implicit Costs : The expenses which are imputed for self-owned and self-employed resources, salary of the proprietor or rent on the owner's own building, etc., are called implicit costs. These costs are frequently ignored in calculating the costs of production.

Explicit and implicit costs are known as the firm's accounting expenses. The costs of the production of a firm include both the costs.

11.3.2 Money Cost and Real Costs

Money Costs : A firm usually incurs money expenses for producing a commodity. A firm spends money on wages and salaries of labourers, for purchasing raw materials, machines and equipment, on depreciation, on power and fuel, etc. These money expenses are called money costs.

Real Costs : Real costs are different from money costs. Money costs are those which are paid by a producer for utilising factor inputs for the production of commodities. But money costs

do not reveal the fact behind these costs. Marshall believes that numerous members of society make sacrifices in their efforts to produce a commodity. These sacrifices and efforts are the real costs of production. Workers forego leisure, capitalists save and invest, and landlords utilise land for production . These sacrifices and efforts made by various members of society constitute real costs of production. According to Marshall, "All the efforts and sacrifices made by the producer are the real costs of production for these efforts are termed as the expenses of production".

But real costs seldom coincide with money costs of the production. Marshall declares that "If the purchasing power of money, in terms of effort has remained constant and if the rate of remuneration for waiting has remained about constant, then the money measure of costs corresponds to real costs; but such a correspondence is never to be assumed lightly. Neither can the sacrifice of a person who serves a few be equated to the painful efforts by a worker receiving Rs. 10/- as wage. Thus the real costs and money costs of production do not coincide with each other in the short-run or long-run".

11.3.3 Opportunity Costs or Alternative Costs

Resoures are scarce, but wants are unlimited. When resources are scarce, they are put to several uses or alternative uses . As they are scarce, there arise economic problem. Otherwise, if they are in plenty there occurs no problem or alternative use of resources. Modern economists disregard the criteria of 'sacrifices and efforts' as real costs. But they express the real costs of production in terms of alternative uses of inputs. Suppose the land is utilised to produce wheat, or it is used to produce paddy instead of wheat, then the cost of land producing wheat is the cost of land producing paddy foregone. It is the next best alternative use foregone. Suppose labour is employed to produce bricks or it is also employed to produce tiles, then the cost of labour producing bricks is the cost of labour producing tiles foregone. Similary it can be applied to any factor input, which has an alternative use. Suppose with a sum of Rs. 500/- a producer can produce two watches or a bicycle, and with the same amount he decides to produce the bicycle is equal to the cost of two watches, that is the alternative foregone.

Opportunity cost has been defined by economists as the cost of production of a commodity, that could have been alternatively used instead. According to Bentham, " The opportunity cost of any thing is the next best alternative that could be produced instead by the same factors, or by an equivalent group of factors, costing the same amount of money". According to Richard G. Lipsey, "The cost of using some thing in a particular venture is the benefit foregone by (an opportunity cost of) not using it in its best alternative use".

Opportunity cost has great importance when applied to economic problems. It can be applied in the determination of factor prices. It can also be applicable to consumption and public expenditure. It explains the phenomenon of price. As the resources are scarce they would be put to alternative uses, that is why there arises the need to understand the opportunity cost.

Check Your Progress -2

2. *What are real costs ?*
3. *Explain the term 'opportunity cost'.*

11.4 Nature of Costs in the Short-Run

The period which is required to bring a change in production by changing variable capital, fixed capital being constant, is called **short-run**. In the short-run, the firm can change production only by changing variable capital. If the firm wants to increase or decrease its production, it has to employ more or less variable capital such as raw-materials and labour. In the short-run, the firm cannot increase production by enlarging the size of the plant or by establishing a new firm. In other words, the scale of the firm canot be changed. That is why, short-run is a period of time in which the production can be altered only by varying the variable capital while the fixed capital of the firm remains the same.

Classification of Costs

Costs of production are classified into two in the short-run, fixed costs and variable costs.

11.4.1 Fixed Costs

In the short-run, fixed costs remain the same whatever the level of production. If the firm stops production, fixed costs have to be borne by the entrepreneuer. Fixed costs include interest on investment made on capital goods, rent on land, wages and salaries of permanent staff, payment of L.I.C. premiums, depreciation charges , etc . Fixed costs are those costs which cannot vary with the level of output in the short-run. The fixed costs are also known as *supplementary cost* or *overhead costs.*

11.4.2 Variable Costs

Variable costs are those costs which change with the level of output. As production increases or decrease, variable costs also increase or decrease. If the firm stops production, it incurs no variable costs. In the short-run there is no doubt that the level of output can be changed by altering the variable capital but it cannot be changed beyond the capacity of the existing firm. These costs include money spent for purchasing raw-materials, fuel, power, transportation charges, wages for casual and temporary labourers, etc. The variable costs are also called *prime costs* or *direct costs.*

11.4.3 Total Costs

A firm incurs some amount of money expenses to produce a given quantity of commodity. The total money spent for producing a given quantity of goods is called Total Costs (TC). In the table given below (Table 11.1) it can be observed that as production increases, the total cost also increases. The total cost of a given quantity is the sum of the total fixed cost (TFC) and the total variable cost (TVC). The **total fixed cost** is the total money spent on fixed factors of production such as machinery and equipment, salaries to the permanent staff, buildings, L.I.C. premiums, etc. In Fig. 11.1 the total fixed cost remains constant regardless of the changes in the level of output because the scale of the firm cannot be changed in the shor-trun. The **total variable cost** is the total money spent on the variable factors such as raw-materials, wages and salaries per casual and temporary workers, electricity charges, etc. As the level of output is increased or decreased the total variable costs also rise or fall. If the firm stops the production of the commodity the total variable costs become zero. In other words, the total variable costs change with the level of production as is indicated in Fig. 11.1.

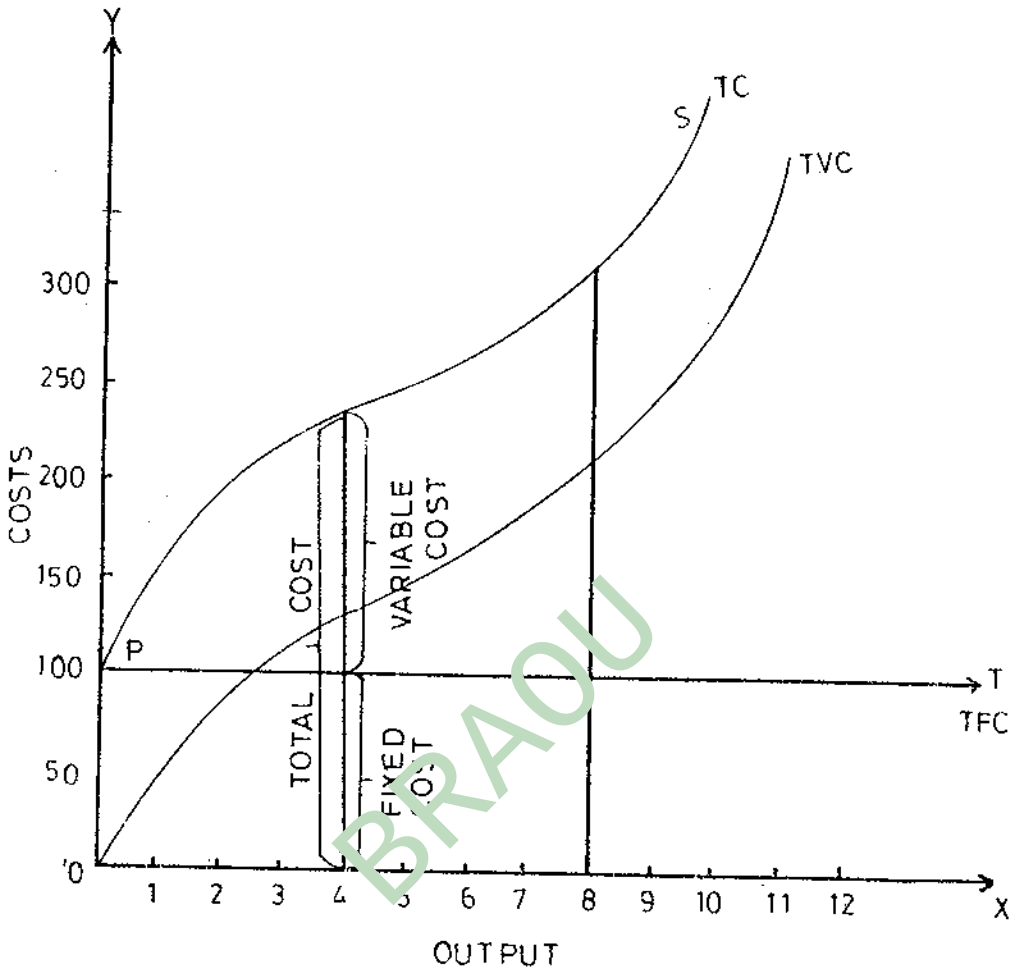


Fig-11.1 Total Cost : Fixed and Variable

Total Cost = Total Fixed Cost + Total Variable Cost. In Fig. 11.1, PS is the total cost curve. It is the sum of the total fixed cost (the distance between PT and OX-axis) and the total variable cost (indicated by the distance between the curves PS and PT).

Check Your Progress-3

4. *Differentiate variable cost from fixed cost.*
5. *Explain total costs . Derive the total cost curve with the help of TVC & TFC.*

11.5 Average and Marginal costs

11.5.1 Average Costs

The **average total cost** (ATC) or average cost (AC) is the total cost divided by the number of goods produced. This is nothing but the cost per unit. Average cost is the sum of the average fixed cost (AFC) and the average variable cost (AVC). As production increases the average cost at first falls and then rises. Average fixed cost decreases continuously as output increases. Average variable cost and average cost are at first noticed to fall due to economies of scale, and then they rise due to diseconomies of large scale production.

A(T) = TC / Number of goods produced.

AFC = TFC / Number of goods produced.

AVC = TVC / Number of goods produced.

A(T)C = AFC + AVC.

11.5.2 Marginal Cost

In the short-period , only variable factors are changed so as to bring change in the production. If the firm intends to produce an additional unit, it has to employ more variable factors on which it spends an additional amount. The additional cost which is incurred to produce one more unit of commodity is called the **marginal cost,** which adds to total cost. Marginal cost can be computed by dividing the change in the total cost by the marginal output.

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

MC = Marginal cost,

ΔTC = Change in total cost, and

ΔQ = Change in quantity.

Since the increase in total cost is equal to the increase in the number of units of variable capital multiplied by the price of the variable capital, this can also be written as

$$MC = \frac{\text{Increase in quantity of variable capital}}{\text{Increase in output}} \times \text{Price of variable capital}$$

OR

$$MC = \frac{\text{Price of variable capital}}{\text{Marginal product of variable capital}}$$

OR

$$MC_n = TC_n - TC_{n-1}$$

Where

MC_n = Marginal cost of **n** th unit of output,

TC_n = Total cost of producing **n** units of output,

TC_{n-1} = Total cost of producing **n-1** (i.e one less) units of output.

This is a very important concept in the theory of value. It is useful in the determination of output which a firm will produce in any period.

Check Your Progress -4

6. *What is average cost?*

7. *Define marginal cost.*

11.6 Short-Run Cost Curves

In Table 11.1 if the firm increases the level of output, it leads to an increase in total costs and total variable costs but the total fixed cost remains the same. It is clear from Table 11.1 that if firm goes on producing more units, the average fixed cost declines continuously but marginal cost, average cost and average variable cost at first decline to a certain extent of output due to the operation of economies of scale and the they start rising due to the emergence of diseconomies.

Table 11.1 indicates that from 5 units of output marginal cost starts rising due to diminishing returns. The average variable cost is obtained by dividing the total variable cost by the corresponding total output. Average variable cost starts rising from 6 units of output, and average total cost stops declining and starts rising from 7 units of output. Marginal cost falls and rises rapidly. Average variable cost and average total cost decline and increase slowly. After the level of 7 units of output, marginal cost rises faster than average variable cost and average total cost, which are less than the marginal cost.

Table -11.1: Cost of Production of a Firm in Short-Run

Units of output	Total Fixed cost	Total Variable cost	Total cost	Average Fixed cost	Average variable cost	Average Total cost	Marginal cost
(i)	(ii)	(iii)	(iv) (ii+iii)	(v) (ii÷i)	(vi) (iii÷i)	(vii) (iv÷i)	(viii)
0	100	—	100	100	—	100	—
1	100	20	120	100	20	120	—
2	100	38	138	50	19	69	18
3	100	52.5	152.5	33.3	17.5	50.8	14.5
4	100	66	166	25	16.5	41.5	13.5
5	100	80	180	20	16	36	14
6	100	99	199	16.7	16.5	33.2	19
7	100	140	240	14.3	20	34.3	41
8	100	184	284	12.5	23	35.5	44

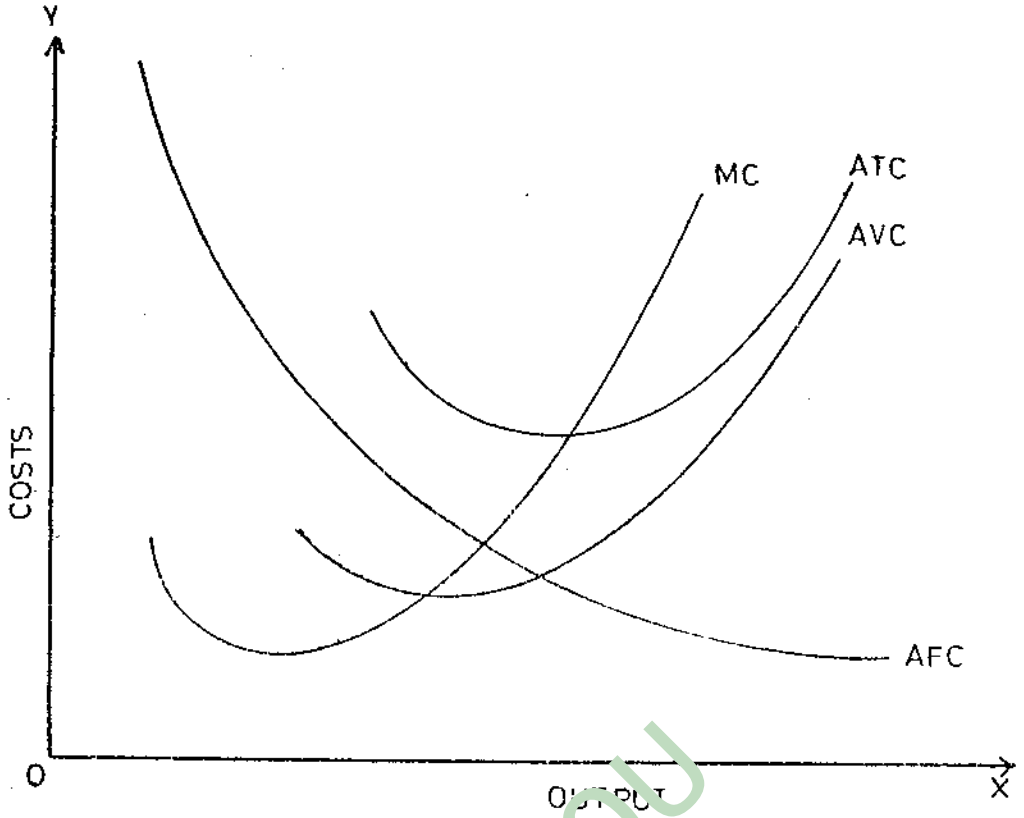


Fig-11.2 Short-Run Cost Curves

If we observe the short-run cost curves carefully in Figure 11.2, we can study the nature of the cost curves. In the beginning all the cost corves of AFC, AVC, ATC and MC are declining. The total fixed costs remain the same whatever the level of output may be, but as production increases the total fixed costs are distributed among the number of units produced. Thus the fixed cost per unit (AFC) curve declines without break. It goes on declining as the level of output goes on increasing. The shape of the AFC curve is in the form of a rectagular hyperhola as at both sides it is rectangular in shape. ATC is the sum total of AVC puls AFC. At first it gradually decreases as production increases. The cost per unit is the lowest and reaches its minimum point at the level of 6 units of output. This is the least cost point (point E) for the given technique. Economies of scale continue to operate till it reaches the level of 6 units of output. If the enterpreneur increases the production further, economies disappear and diseconomies set in due to the law of diminishing returns so that the cost per unit gradually increases. The ATC curve lies above the AVC curve. At first it lies above the MC curve and after reaching the minimum point, it lies below the MC curve. The reason why it slowly increases and decreases is this. The AFC curve declines continuously and the AVC curve decreases and increases slowly. The ATC curve is the sum total of AFC and AVC, that is why it gradually decreases and increases. The ATC curve reaches its minimum point after the MC and AVC curves reach their respective minimum points. AVC is the cost per unit for employing variable factors. In the beginning it starts declining gradually due to economies and reaches the minimum point at the level of 5 units of output earlier than the ATC curve, and after the MC curve reaches its minimum point. It starts rising even when the ATC curve is declining. As production is

further increased, the AVC increases faster than the ATC and goes closer to the ATC curve. The gap between ATC curve and AVC curve is gradually reduced, whereas in the beginning the gap between the two was wide.

If we look at the MC curve, as the firm goes on producing additional units of commodities , it falls rapidly and then rises very fast. This decline and rapid rise occur because it is the cost per extra unit produce but not the average cost or cost per unit, which can be derived by the total cost divided by the number of units produced. Due to the operation of economies of scale as additional units are produced, it at first starts declining swiftly reaching the minimum point at 4 units of output, and then starts increasing fast due to the emergence of diseconomies of scale intersecting the AVC curve and the ATC curve at their lowest points and rising above them. It reaches its minimum point earlier than the AVC and ATC curves. The MC curve lies below the AVC and ATC curves while they are declining. When the AVC and ATC curves are increasing, the MC curve is higher than both curves. The MC curve intersects both the AVC and the ATC curves at their lowest points.

Check Your Progress -5

8. Derive average variable, average fixed and total average cost curves in the short-run in a graph.

9. What is the shape of AFC?

10. What is the situation of AVC?

11.7 Relationship Between Average Cost and Marginal Cost

If we look at Figure 11.2 the relationship between average and marginal costs can be easily understood. It is clear from Figure 11.2 that in the beginning both the marginal and average costs are falling, but marginal cost is declining faster than average cost because of the additional amount spent on the production of the more unit. Average cost declines slowly because the total costs of the firm are equally distributed among all the goods produced. Average cost is the sum of the average fixed cost and the average variable cost. As production increases the average fixed cost declines continually whereas the average variable cost at first declines and then rises.

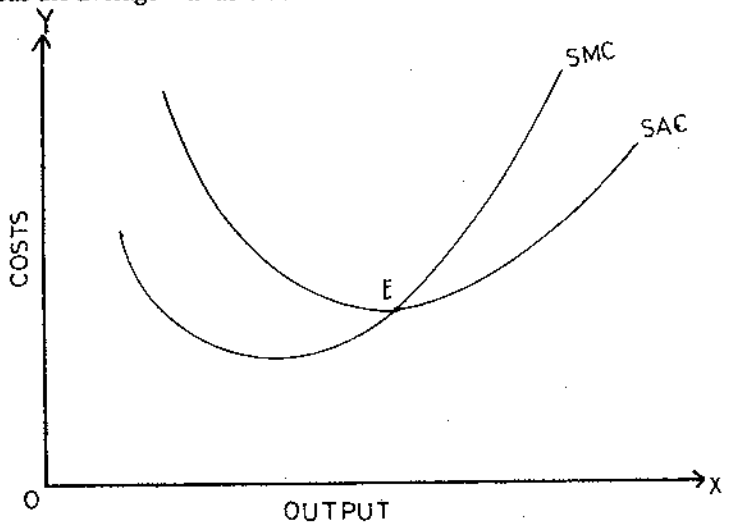


Fig-11.3 Relationship of Short run Average cost and Marginal cost

While the AC curve is falling, the MC curve is also declining, but at a faster rate than the AC curve. The MC curve reaches its minimum point earlier than the AC curve reaches its lowest point. The MC curve starts rising while the AC curve is still falling. When the AC curve reaches its minimum point, E, the MC curve is still rising and passing through the minimum point of the AC curve. If output is further increased, the AC curve also starts rising but less than the MC curve. When both the MC and AC curves are rising, the MC curve is above the AC curve. While the AC and MC curves are declining the MC curve lies below the AC curve.

Check Your Progress -6

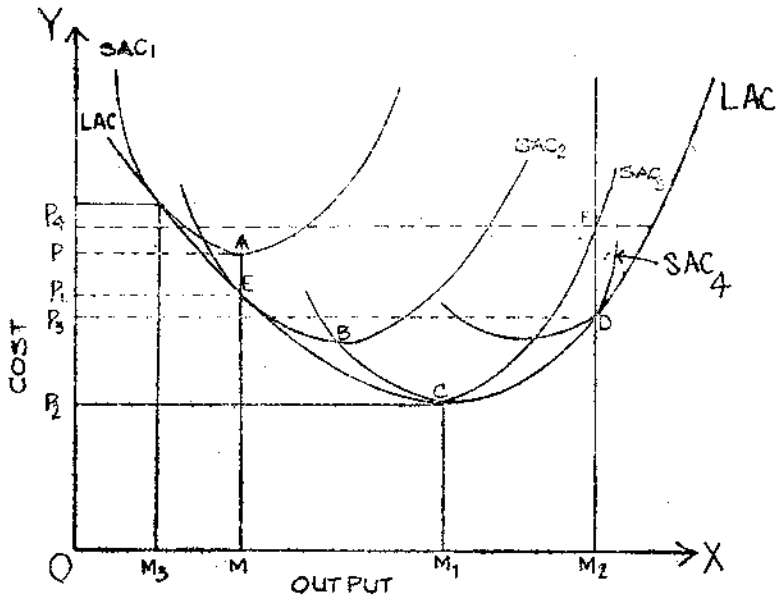
11. Explain the relationship between AC & MC in a nutshell.

11.8 Long - run Costs

The term long-run does not refer to any fixed years of calendar time. We cannot say whethar a 10 year period or a 15 year period is a long run. Similarly, short-run period, as explained earlier, is the period in which there is no possibility of changing the size of the plant of fixed capital. In the short-run some factors remain fixed and the other variable factors such as labour, etc., are changed to bring change in output. In the short run somefactors are kept constant and other factors are variable. In the long-run, all factors can be changed so as to bring change in the level of production. There are no fixed costs but all factors are variable. The very long period is a period where the capacity of the plant will have run out to meet the shifts in demand and its equipment will have been worn out and will therefore need replacement, etc. In the long run, a firm changes its present policies and commitments. For example, if the company finds that the demand for its product has increased substantially, it may be five years or ten years or fifteen years before it decides to change the size of the plan and equipment completely so as to meet the increased demand. If demand changes rapidly, the enterpreneur will have to redesign the size of the firm so asto make it profitable. Thus the long-run period is itself an economic variable. In fact, according to Leftwich, the long run is "a series of alternative short-run situations into any one of which a firm can move. The long-run may be compared with the action sequence of motion picture. If we stop the film and look at a single picture we have a short-run concept".

If a firm decides to change a certain level of output, it has to choose some method among the many technically posible methods. The producer has to choose some method to minimise cost and to maximise profit. That is, what he has to choose is the least costly method of production from the alternative techniques available. If the producer chooses to have a new method, he has to change all the factors, the fixed as well as the variable. That is why the long-run is the period in which all the factors which were variable rarely become fixed. Once installed they last for a long time. It depends on the entrepreneur's capability to select a method which rewards him with large profits and bonuses.

In Fig.11.4 SAC_1 is a small-sized plant. It has a certain amount of capital which is fixed in the short run. SAC_1 is the short run average cost curve. In the short-run, the producer can change his output over the U-shapped short-run average cost curve. The average cost OP is the minimum at point A on SAC_1 at OM level of production. In the long run, if OM is the profitable level of output,



FI1.4 Long Run Cost Curves

he can increase the profitability of this ouput by installing a larger plant. If he were able to obtain just the right adjustment, he could set up the plant corresponding to SAC_2 which is larger than SAC_1. SAC_2 represents the short run average cost curve. Then the producer could produce the same amount of OM at the average cost of OP_1 which is less than the average cost of OP. OP_1 is the minimum unit cost of producing OM units obtaining with the plant SAC_2 . This is not the minimum cost for this plant. But for this SAC_2 plant , the minimum cost is the point B on the short run average cost curve SAC_2. Even then, at the level of output OM_1 the minimum unit cost is OP only . This is the least possible cost for producing OM unit of output. Either a smaller plant say the one corresponding to SAC_1 or a larger plant, say the plant giving rise to SAC_3, would entail a higher unit cost for producing the same OM units of output.

However, in this example, the producer may still reduce unit cost in the long-run, producing a greater quantity of output. Indeed he may keep expanding his capital facilities until he has set up the plant corresponding to SAC_3 in the Fig 11.4 At point C on SAC_3, the very best average cost of production is obtained. If the producer can profitably market OM_1 units of output, then he can produce this amount for an average cost of OP_2.

If the producer still wants to expand production, he can do so more economically in the long run by establishing a larger plant but the average cost will exceed OP_2. For example, if he wishes to produce OM_2 units of output, he can do so most economically by setting up the plant corresponding to SAC_4. The least possible cost of producing OM_2 units is obtained at the average cost of OP_3 with the SAC_4 plant. Suppose OM_2 units of output are produced with the help of the plant SAC_3 the cost per unit will be higher, i.e., OP_4 because of the size of the plant which is smaller than SAC_4. That is why SAC_4 is an economically viable plant which is smaller than SAC_4. This is nevertheless greater than the absolute minimum unit cost of OP_2. Thus, in the long run, it is desirable, in order to produce any level of output to use the plant which has the minimum unit cost. In this case, it is the SAC_3 plant which has the minimum unit cost OP_2 at OM_2 output.

So far we have looked only at a series of short-run cost curves SAC_1, SAC_2,etc. Now draw a curve that is just tangential to each of these short-run cost curves. The curve so drawn is called the envelope of the family of short-run curves. It is labelled as LAC in Figure 11.4 and it is the long-run average cost curve. It is called the **"Planning Curve"**. The LAC is at a tangent to all SAC curves but it touches only one SAC_3 curve at its lowest point C as in Figure 11.4. If the producer wants to produce either the OM_3 or OM_2 level of output instead of producing the OM_1 level of output, then the cost per unit will be higher. If he wants to produce OM_1 units of output the cost per unit is the minimum compared to that of output OM_3 or OM_2. The OM_1 level of output is the least-costly output. That is why it is called the **optimum output**. In Figure 11.4, the plant SAC_3 is producing OM_1 output with the minimum cost OP_2. The minimim point C of SAC_3 coincides with the minimum point of LAC. That is why it is the **optimum firm.**

11.8.1 Shape of LAC Curves

LAC curves are U - shaped just as the short run average cost curves are. But LAC is flatter than the SAC. The shape of LAC is like the shape of a saucer. As output increases, the LAC declines up-to a stage where it reaches the minimum point, i.e., optimum output. After this point, if production increases, the LAC rises. The shape of LAC depends on the operation of the laws of returns to scale in a particular type of production. There are different points of view to explain why the LAC declines and then rises. One such point of view is referred to by Chamberlin.

According to Chamberlin, initially the LAC slopes downwards due to increasing returns to scale. He attributes the increasing returns to scale to increased division and specialisation of labour and equipment on the one hand and employment of qualitatively different and technologically more efficient units of factors (particularly machines) on the other. In the long run, if the entrepreneur expands production, the firm enjoys internal economies of production such as installing better machines, borrowing money cheaply, procuring the services of a more efficient manager and workers, etc. These internal economies contribute to increasing returns to scale.

If the output is OP then the LAC reaches its minimum. If the production is further expanded at the minimum level of LAC it may become flatter. In such a situation the economies and diseconomies of scale equal each other and the LAC has a disc base. If output is further increased diseconomies like the difficulties of coordination, managerial problems, labour problems, etc. erupt and outweigh the economies. Then, the long-run average cost curve begins to rise.

In this manner, the LAC curve falls or rises more slowly than the short-run cost curve. In the long run all costs become variable. That is why the LAC is flatter than the short-run average cost curve.

Similarly, the long-run marginal cost curve LMC is flatter than the short-run marginal cost curve. In the short run there are fixed as well variable costs. Thus the SMC falls and rises more rapidly than the LMC. The LMC first falls and then rises interesecting the LAC at its lowest point E. While LMC is falling, it lies below LAC and while it is rising it lies above the LAC curve. A rising LMC intersects LAC at its minimum point and rises further.

11.9 Summing Up

This unit has analysed different kinds of costs which are useful in determining the equilibrium of a firm. As a rational human being, producer wants to minimise his cost of production to produce a unit of output. What is this cost of production? When a producer utilizes some inputs to produce a commodity, he pays remuneration to them. The total remuneration paid to different factors in the process of production of a commodity is called the cost of production. Costs can be of short run or long run; of explicit or implicit; or money costs or real costs, and of opportunity costs. We have classified the costs as total costs, fixed costs, variable costs, marginal costs, averge costs, average variable costs and average fixed costs. The relationship between and among the different costs is explained. In the end, long run cost curve is derived. In the long run, all costs are variable costs, but in the short run, the difference exists between variable costs and fixed costs.

-Sri. P. Rajesham

11.10 Suggested Books

1. A. Koutsoyiannis : Modern Micro Economics
2. Stonier and Hague : A Text Book of Economic Theory

11.11 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is short period in economics? Explain and distinguish between fixed and variable costs.
2. Explain and illustrate diagrammatically the short run cost curves of a firm.
3. Derive the long run cost curve of a firm and explain its U- shape.

II. Answer each of the following questions in about 15 lines.

1. Write a brief note on opportunity cost.
2. Distinguish real costs from money costs.
3. Explain the relationship between average cost and marginal cost.
4. What do you mean by long run costs ?

Unit - 12 : Revenue Analysis

Contents

12.0 Aims and Objectives

This unit identifies three concepts in revenue analysis and diagrammatically analyses the revenue curves in perfect competition, monopoly and oligopoly. It discusses the relationship among average revenue, marginal revenue and elasticity of demand.

After reading the unit, you will be able to

* define the conceepts of revenue - TR,AR & MR
* derive the revenue curves in perfect competition, monoploy and oligopoly, and
* distinguish the relationship between or among AR, MR and elasticity of demand.

12.1 Introduction

The concepts of revenue are necessarily to be known to understand the notion of the equilibrium of a firm. You will be knowing in the next few units that there are two types of markets, namely, perfect and imperfect competition. Revenue curves will be different in different markets.

12.2 Kinds of Revenue

There are three concepts of revenue: 1. Total Revenue 2. Average Revenue 3. Marginal Revenue.

12.2.1 Total Revenue (TR)

A firm's total revenue is the quantity of goods sold multiplied by the price of the articles. The total revenue includes the product of the quantity sold and the price. For example, suppose a firm sole 10 books and it received Rs. 200/- for the ten books sold. This amount is called the total revenue. Total revenue can be calculated if the price of a product is known.

T.R. = Price X Quantity sold

12.2.2 Average Revenue (AR)

A firm's average revenue is nothing but the price per unit. This can be derived by the firm's total revenue divided by the number of goods sold. Suppose the firm receives a total revenue of Rs. 200/- by selling 10 books, the average revenue is

A.R. = Total Revenue /Output sold
=200/10 = Rs.20/- per book.

Revenue per unit or price of the article is Rs. 20/-.

A.R. = TR/Q,
A.R. = Average Revenue,
T.R. = Total Revenue and
Q = No.of goods sold

12.2.3 Marginal Revenue (MR)

The marginal revenue is the change in total revenue received by selling an additional unit of the commodity. By selling an additional unit, a firm earns an additional revenue which adds to the total revenue and this additional revenue is called marginal revenue. Suppose a firm receives a total revenue of Rs.18/- by selling 3 books and it receives a total revenue of Rs. 20/- by selling 4 books. Then the marginal revenue is Rs. 2/- because it indicates the addition to the total revenue due to the sale of the 4th commodity which is an extra or additional or marginal unit sold.

MR = Total Revenue of 4 units - Total Revenue of 3 units.

MR = Rs. 20 - Rs. 18 = Rs. 2.

Similarly this can also be explained algebraically,

MR = TRn+1 - TRn ..... (1)

Or

MR = Price of (n+1) th unit - Loss in revenue on previous 'n' units resulting from a fall in price ..... (2)

TR_{n+1} = Total Revenue of (n+1) units,

TR_n = Total Revenue of 'n' units.

Table -12.1 : Total, Average and Marginal Revenue Schedule

No. of units sold	Price or Average Revenue (AR)	Total Revenue (TR)	Marginal Revenue (MR)
(1)	(2)	(3)	(4)
1	8	8	-
2	7	14	6
3	6	18	4
4	5	20	2
5	4	20	0
6	3	18	-2
7	2	14	-4

The law of demand states that when price falls demand increases. Suppose, as in Table-12.1, that a firm sells 3 units at price Rs. 6. The firm reduces the price of the product so as to attract the consumers or buyers. If the firm reduces the price of the product from Rs. 6 to Rs. 5, it now sells 4 units. The total revenue of units is Rs. 18 (Price Rs. 6 X 3 units sold) and the total revenue of 4 units is Rs. 20 (Price Rs. 5X4 units sold). Thus,

$MR = TR_{n+1} - TR_n$

MR = TR of 4 units - TR of 3 units

MR = Rs. 20 - Rs. 18 = Rs..2.

Marginal revenue can also be computed by using the second equation. According to the law of demand, more goods will be offered at a lower price. In Table - 12.1, the firm offers 3 units at a price of Rs. 6. The firm sells 4 units of the commodity by reducing the price to Rs.5. This involves a loss in revenue on the previous goods due to the reduction in price. When the price is Rs. 6, only 3 units were sold and when the price fell to Rs. 5 the firm sold 4 units. This must be understood to mean that the previous units plus the additional unit are also sold at Rs. 5. It is necessary to reduce the price of the previous goods to the selling price of the 4th article. There is a loss of Re. 1 on each of the previous 3 units. The total loss in revenue on the previous 'n' (or 3 units) is Rs. 3. This loss in revenue of Rs. 3 must be deducted from the price (Rs. 5) of the last unit sold or (n+1)th unit or 4th unit sold. Thus,

MR = Price of (n+1)th (or 4th) unit - Loss in revenue on Previous 'n' (or 3) units.

MR = Rs. 5 - Rs. 3 = Rs. 2.

For instance, when 2 units are sold, the marginal revenue is Rs. 6 (Rs. 14 - Rs. 8); when 3 units are sold, it is Rs. 4 (Rs. 18 - Rs. 14) and so on. It is obvious from Table - 12.1 that the decrease in average revenue will be less than the decrease in marginal revenue. When price is reduced say from Rs. 7 to 6 , the decrease in average revenue is only Re. 1 (Rs. 7 - Rs. 6) and decrease in marginal revenue is Rs. 4 (Rs. 18 - Rs. 14).

Average and marginal revenue curves can be drawn for the above data. The quantity of the commodity is measured on the OX-axis and the revenue on the OY-axis. As the decrease in marginal revenue will be higher than the decrease in average revenue, the marginal revenue will be less than average revenue at all levels. When price decreases from Rs. 5 to Rs. 4, the marginal revenue is zero and the MR

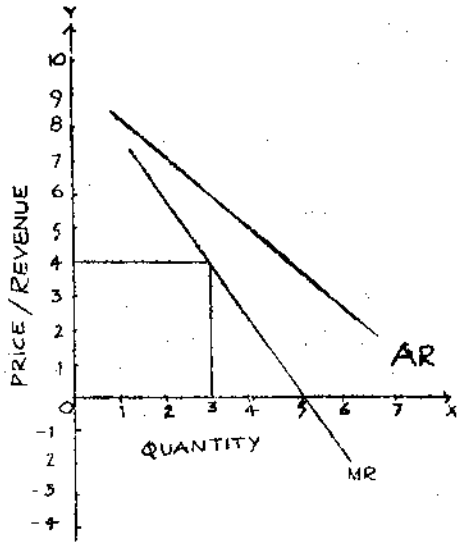


Fig. 12.1: Average and Marginal Revenue Curves

curve cuts the X-axis. When the price is reduced from Rs. 4 to Rs. 3, 6 units of the commodity are sold and at this level marginal revenue becomes negative. Total revenue also comes down from Rs. 20 to Rs. 18. This is a general diagrammatic representation of marginal revenue and average revenue.

Check Your Progress - 1

1. *What is total revenue?*
2. *What is average revenue?*
3. *Define marginal revenue.*
4. *Show the relationship between AR & MR in a general market.*

12.3 Revenue Curves in Perfect Competition

Normally average revenue (price) is greater than marginal revenue as shown in the Figure-12.1. But in perfect competition, an individual firm cannot influence the ruling price, so the firm can offer any quantity of the goods at the given market price. Marginal revenue is equal to average revenue because there is no loss on the previous units.

Table -12.2 : Demand and Revenue Schedule of a Firm in Perfect Competition

(in Rupees)

No of units sold	Average Revenue or Price (AR)	Total Revenue (TR)	Marginal Revenue (MR)
(1)	(2)	(3)	(4)
1	10	10	10
2	10	20	10
3	10	30	10
4	10	40	10

In perfect competition as there are a huge number of firms, the price of the product is not determined by a single firm or an individual. When there is no change in the market price, if more goods are sold at the same price, the marginal revenue will be equal to the average revenue (MR = AR). Table-12.2 shows the demand and revenue schedule of a firm in perfect competition. Let us suppose that we assume the market price remains constant at Rs. 10. As demand increases the firm will prefer to sell any quantity of the goods at the existing price. Suppose the firm sells one commodity at price 10, it earns a total revenue of Rs. 10 only. If it sells 2 units at the same price, it receives a total revenue of Rs. 20. By selling an additional unit, i.e., the 2nd unit, it gets a net revenue or additional revenue or marginal revenue of Rs. 10 (Rs.20 - Rs.10). As more and more units are offered at the same market price, the total revenue will increase but there will be no change in marginal revenue. The rate of increase in total revenue will be the same as the average revenue or price and will be equal to the marginal revenue.

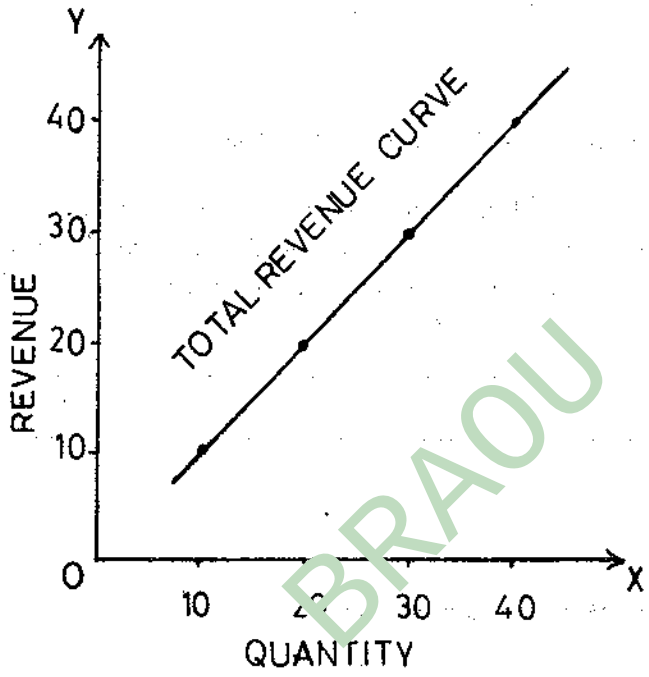


Fig- 12.2: Total Revenue Curve in Perfect Competition

In Figure-12.2 we have drawn a total revenue curve (TR). As the quantity sold increases at the ruling price the total revenue also increases. When one unit is sold, the total revenue is 10; when 2 units are sold at the same price the total revenue is Rs. 20 and so on. The total revenue curve (TR) rises upwards from left to right.

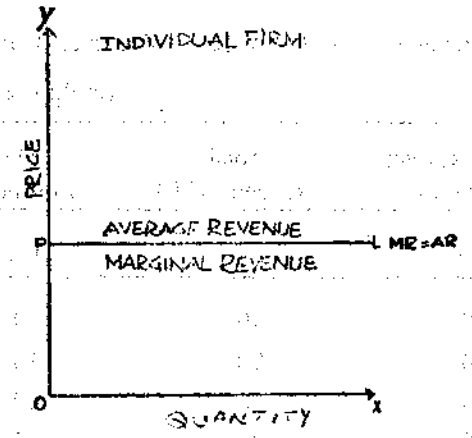


Fig- 12.3: Average and Marginal Revenue Curves in Perfect Competition

In Figure - 12.3 we have drawn the average revenue (AR) and marginal revenue (MR) curves. The firm sells any quantity of output at the given price, Rs.10. The price being constant in perfect competition, as the volume of output increases the total revenue increases but the additional revenue received (MR) by selling an additional unit is equal to the price (AR). Hence the marginal revenue curve coincides with the average revenue curve. In Figure-12.3 at a price of Rs.10 the average revenue and marginal revenue are the same straight line curve PL, which is parallel to OX-axis.

Check Your Progress - 2

5. Define the total revenue curve in perfect competition.

6. What is the relationship between average revenue and marginal revenue in perfect competition?

12.4 Revenue Curves in Monopoly

In imperfect competition, a competition where the assumptions made under perfect competition will not prevail, the demand curve or average revenue curve of a firm is less than perfectly elastic which means that the average revenue curve has a negative slope and the marginal revenue curve lies below the average revenue curve. In monopoly, there is only one seller or producer in the market. He clears off his goods according to the market because he reduces the price of the goods. If the monopoly firm offers more goods at a lower price, it is clear that the average revenue curve will fall and the marginal revenue curve which lies below the average revenue curve will also fall. This phenomenon can easily be understood from the following imaginary demand and revenue schedules for a firm under monopoly.

Table - 12.3 : Demand and Revenue Schedule for a Firm in Monopoly

Quantity of X	Average Revenue or price (AR)	Total Revenue (TR)	Marginal Revenue (MR)
(1)	(2)	(3)	(4)
1	7	7	-
2	6	12	5
3	5	15	3
4	4	16	1
5	3	15	-1

In Table-12.3, Columns 1 and 2 represent the relationship between demand and price. This relationship gives the demand curve of the monopolist. As price falls the demand for the commodity will increase. When the price falls from Rs. 7 to Rs. 6, the demand increases from one unit to two units. But the total revenue increases from Rs. 7 to Rs. 12. This is shown in Column 3. The total revenue can be obtained by multiplying the quantity demanded and the price of the product. By selling an additional unit, the monopolist receives net revenue which is called marginal revenue as shown in Column 4. If one unit of the product is sold, he earns a total revenue of Rs. 7. If he sells 2 units at the reduced price of Rs. 6 , he gets a total revenue of Rs. 12. The marginal revenue of the second unit can be derived by substracting the total revenue of one unit sold from the total revenue of 2 units sold. For example, the marginal revenue of the second unit is Rs. 12 - Rs. 7 = Rs. 5. Similarly the marginal revenues of other units can also be obtained.

These facts can be explained with the help of a diagram. It is clear from Figure-12.4 that the demand curve or average revenue curve (AR) is sloping downward to the right which indicates that more commodities are sold as the price falls. Marginal revenue (MR) is the corresponding marginal revenue curve. This curve is also sloping downward to the right but it lies below the average revenue curve all levels.

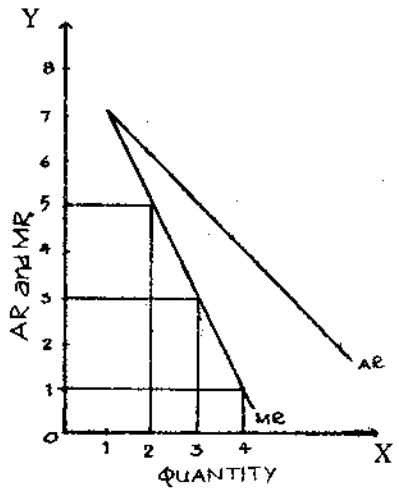


Fig - 12.4 : Average and Marginal Revenue Curves in Monopoly

In Figure-12.5 TR is the total revenue curve. Total revenue increases as the sale of commodities increases due to a reduction in the price of the product. The rate of increase in total revenue is not the same as in perfect competition, but it increases at a diminishing rate. Total revenue increases upto the sale of 4 goods only. If the price is further reduced, more goods will be sold but the total revenue will decline.

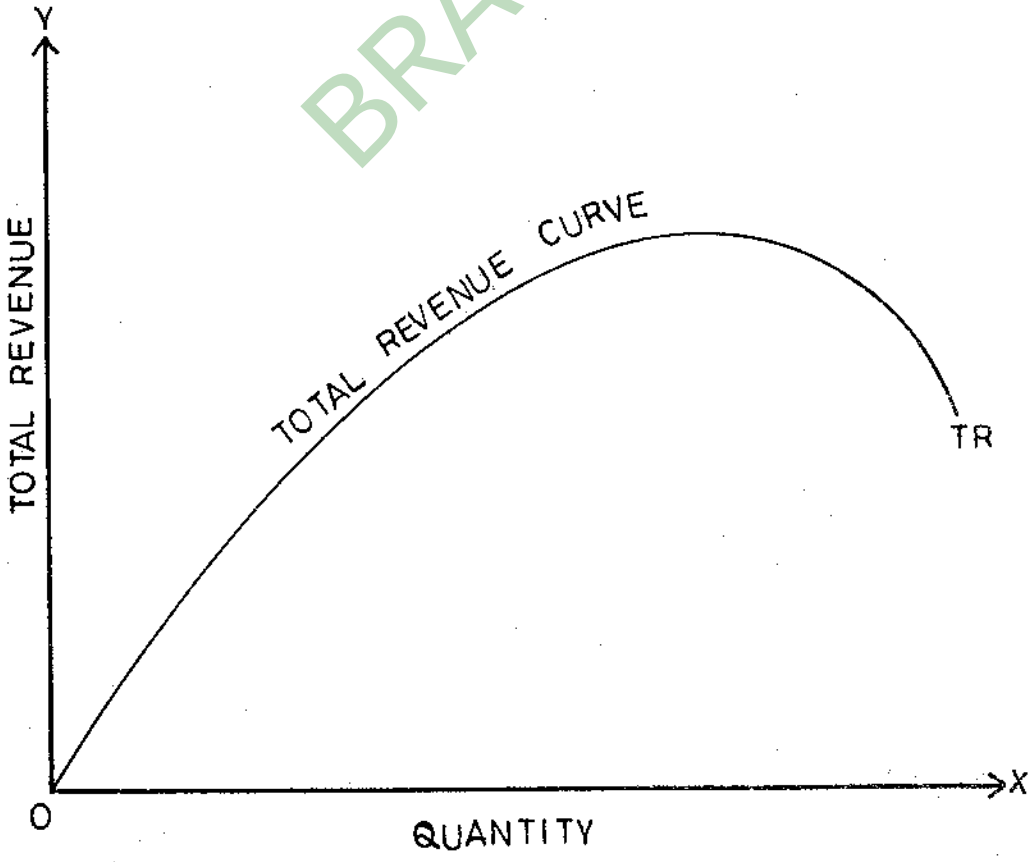


Fig- 12.5: Total Revenue Curve in Monopoly

Check Your Progress - 3

7. What is the shape of TR curve in monopoly?

8. Graphically show the AR and MR curves in monopoly.

12.5 Relationship Between AR and MR Curves

Here we shall concern ourselves with the AR and MR curves in the analysis of the theory of price. The relationship between AR and MR have to explain to some extent. Now we have to explain the relationship between the AR curve and the corresponsing MR curve geometrically with the help of the following figure.

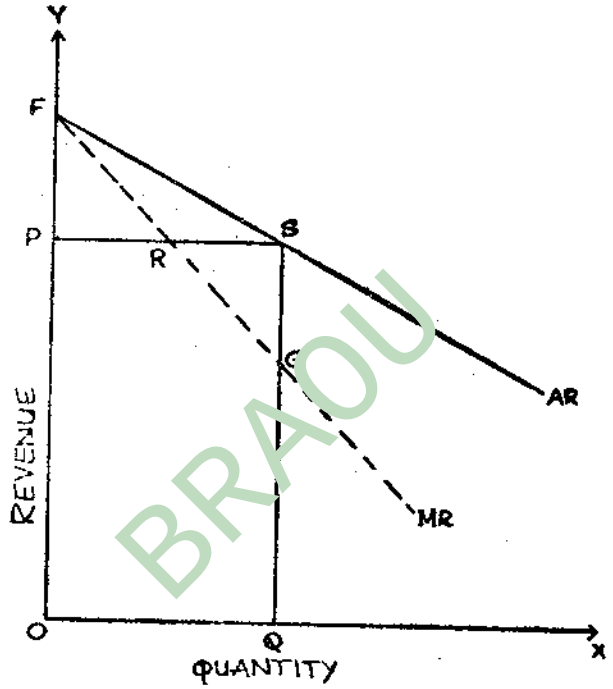


Fig. 12.6. Relationship between Average and Marginal Revenue Curves

As shown in Figure-12.6 MR must be lesss than AR, as long as ARC is falling. The MRC normally falls downwards. Some times it may be horizontal or rising depending on the market situations. In the case of a straight line, the AR and MR curves fall downwards and MRC is lower than ARC. The rate of fall in marginal revenue curve is double to that of the rate of fall in AR curve. If we draw a perpendicular line from AR to the OY-axis, the MR curve, the dotted line, cuts the perpendicular line when it is half way to AR curve. In Figure-12.6, PR = RS.

12.6 Relationship among AR, MR and Elasticity of Demand

The relationship between average revenue and marginal revenue at any level of output has been explained earlier. This has great importance in economic analysis. The demand curve of a firm is the same as the average revenue curve. Here we shall study the relationship between average revenue, marginal revenue and elasticity of demand. The elasticity of demand is measured on the average revenue curve in Figure-12.7.

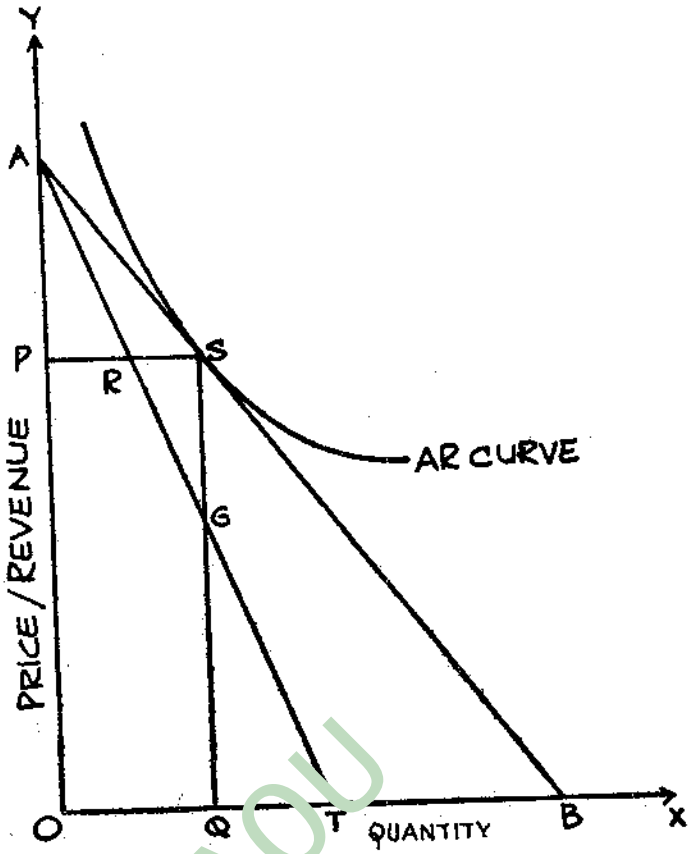


Fig- 12.7 : MR, AR and Elasticity of Demand

In Fig. 12.7, the elasticity of demand at point 'R' is equal to the lower segment SB/upper segment SA.

The elasticity of demand can be defined as:

$$\text{Elasticity of demand } (\eta d) = \frac{\text{Proportionate change in the quantity demanded for X}}{\text{Proportionate change in the price of X}}$$

We can write the formula of elasticity of demand in the following manner:-

$$\eta_d = \frac{AR}{AR-MR}$$

$$\eta_d (AR-MR) = AR$$

$$\eta_d . AR - \eta_d . MR = AR$$

$$\eta_d . AR - AR = \eta_d . MR$$

$$MR = \frac{\eta_d . AR - AR}{\eta_d}$$

$$MR = \frac{AR (\eta_d - 1)}{\eta_d}$$

$$MR = AR (1-1/\eta_d).$$

Where, MR = Marginal Revenue,
AR = Average Revenue, and

η_d = Elasticity of demand.

On the basis of the formula derived above, we can find out the relationship between MR and AR at different points of elasticity of demand as in the figure drawn below.

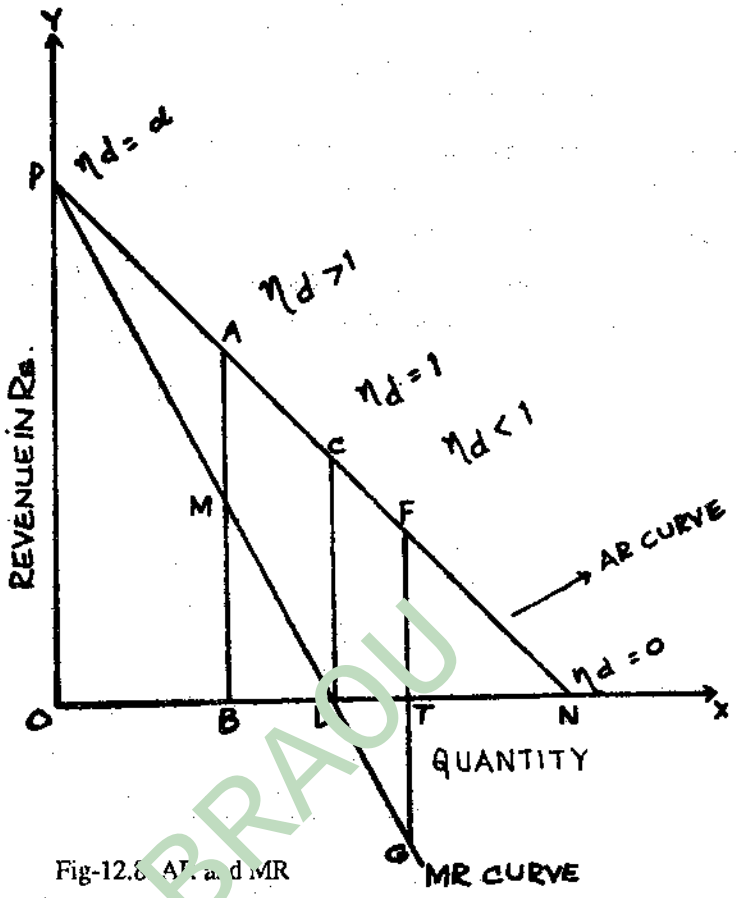


Fig-12.8 AR and MR

At point C on the AR curve or PN; the elasticity of demand is equal to 1.

$$MR = AR(1-1/\eta_d)$$

$$MR = AR(1-1/1) = AR\frac{(1-1)}{1} = AR\frac{(0)}{1} = 0.$$

The marginal revenue curve is zero, when it touches the OX-axis at point D. When the elasticity of the AR curve is unity, the marginal revenue is always zero. If the elasticity of AR curve at point A is greater than unity, say at 2,

$$MR = AR\frac{2-1}{2} = 1/2\ AR.$$

It indicates that when the elasticity of AR is greater than one, the MR is always positive. It is MB in Figure. 12.8.

If the elasticity of the AR curve is less than unity say '1/2',

$$MR = \frac{1/2-1}{1/2} = \frac{-1/2}{1/2} = -1/2 \times 2/1 = -1.$$

The MR is negative at point F on AR curve. If the elasticity is less than unity, MR is negative to TG.

Check Your Progress - 4

9. Show the relationship between AR, MR and elasticity of demand through an equation.

12.7 Special Cases of Revenue Curves

Theree are many special cases of average and marginal revenue curves, which have been explained by Mrs. Joan Robinson. Two types of special cases of average and marginal revenue are explained below.

12.7.1 Rectangular Hyperbola Revenue Curves

In the case of the AR curve which is in the shape of a rectangular hyperbola, throughout its length, if the elasticity is equal to one, then the marginal revenue will be zero, and will coincide with the X-axis as in Figure-12.9.

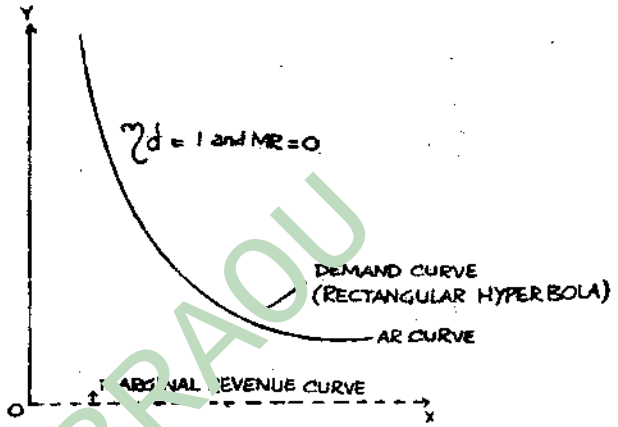


Fig - 12.9: Rectangular Hyperbola

Suppose, $\eta_d = 1$

$$MR = AR(1-1/\eta_d)$$

$$= AR(1-1/1) = AR(0)/1 = 0.$$

12.7.2 Revenue Curves in Oligopoly

Oligopoly means that a few sellers or producers sell a commodity in the market. In oligopoly, the demand curve or AR curve and MR curve will not be smooth curves. They will have kinks. As the number of sellers and the markets are small, if a firm reduces the price for its product, the other oligopolists will also reduce the price. As a reasult the firm reducing the price will only experience a relatively small increase in sales.

In the Figure-12.10 we observe that there is a kink in the demand. This is associated with a vertical jump EF in the marginal revenue curve MR. It is discrete at the point of the kink. There are two linear branches in the demand curve. They are RT and TD which is steep. We have to draw the MR curve corresponding to the RT demand curve. This is RE in Figure 12.10. Next, draw the MR curve for the second part of the demand curve TD. This is FMR. EF is the vertical displacement in the marginal revenue curve MR.

If the firm in Figure. 12.10 wants to sell more by reducing its price P, all the other firms will follow by matching the price cut, so that the firm will earn only a relatively small increase in sales. In the region

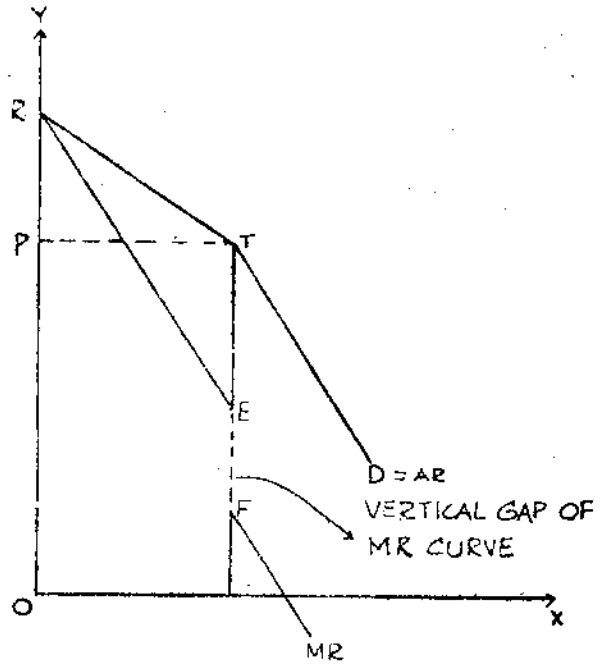


Fig - 12.10: Elasticity of Demand, MR and AR in Oligopoly

below the initial price P or T, the demand curve D will be steep. There is a kink at point T. The AR and MR curves are important tools in economic analysis. AR is the demand of the firm in question. The AR curve indicates the price line for the producer in the market conditions. The relationship of the AR and AC curves reveals whether the firm reaps normal or abnormal profits or incurs losses. If AC at the point of equilibrium lies above the AR curve, the firm incurs loss. If AC lies below the AR curve the firm earns more than normal profits. If the AR curve is at a tangent to the AC curve at the point of equilibrium, it yields normal profits.

We can also judge whether the firm is utilising its capacity or not by taking into consideration the relationship between AR and AC. If AR curve is tangential to the AC curve at its minimum in the equilibrium condition, the firm is running at its full capacity. The equality of MR and MC determines the equilibrium position of the firm under all market situations. This will show the profit maximising output.

Check Your Progress - 5

10. Show, diagrammatically, the rectangular hyperbola average revenue curve.

11. What is oligopoly?

12. Diagrammatically explain the average and marginal revenue curves in oligopoly.

12.8 Summing Up

As explained in the introduction, equilibrium of a firm is determined on the basis of revenue and cost. This unit has touched upon different concepts pertaining to revenue. The shapes of different revenue curves in different markets are also explained. Here you should not forget that the shapes of total revenue curve, average revenue curve and marginal revenue curve in perfect competition differ from those of monopoly.

In perfect competition, total revenue increases proportionately to number of units sold as the price does not change. As no individual can change the price, marginal revenue will be equal to average revenue. But in monopoly, a producer can change either his production or the price of his produce. So, total revenue increases as the sale of commodities increases but it increases at a diminishing rate (see total revenue curve in fig. 12.5). If a monopolist prefers to sell more goods at a lower price, average revenue curve will fall, marginal revenue will also fall and it will be below the AR curve. The rate of fall in MR curve is double to that of the rate of fall in AR curve. This is the relationship between AR and MR curves. The relationship among AR, MR and elasticity of demand is explained in the later part. In the end, special cases of revenue curves are illustrated diagrammatically.

-Sri. P. Rajesham

12.9 Suggested Books

1. A. Koutsoyiannis : Modern Micro Economics

2. Stonier and Hague: A Text Book of Economic Theory.

12.10 Model Examination Questions

I. Answer each of the following questions in about 50 lines.

1. Explain and show the shape of marginal and average revenue curves of a firm in perfect competition.
2. Explain diagrammatically the relationship among AR, MR and elasticity of demand.
3. Depict and explain the shapes of average, marginal and total revenue curves of a firm in monopoly.

II. Answer each of the following questions in about 15 lines.

1. Depict and explain Kinky demand curve of an oligopoly firm.
2. Distinguish between perfect competition and monopoly in regard to total revenue curve.
3. Describe the following concepts:
   Total revenue, average revenue and marginal revenue.

Unit - 13 : Equilibrium of the Firm

Contents

13.0 Aims and Objectives

The purpose of this unit is to know what the firm is, what objectives generally it consists and how the firm gets its equilibrium.

After reading this unit, you will be able to

* recall the meaning of the firm,
* identify the objectives of the firm
* list the assumptions under which a firm gets equilibrium, and also the conditions for equilibrium, and
* demonstrate the two approaches which explain the equilibrium position.

13.1 Introduction

In economics the "firm" refers to a unit of control. It controls productive operations by hiring the services of factors of production. It sells services to other firms. A firm may have a

variety of business undertakings. The firm takes decisions to produce any commodity. It also designs the nature and quality of the product. It plans to adopt the method of producing the commodity.

Taking into consideration the capacity required and the conditions in the market, the firm has to decide the quantity of goods to be produced.

Finally it has to frame selling costs and pricing policies. The purposee behind all these decisions is to maximise profits.

13.2 The Concept of Firm

A firm is that which mobilises resources such as raw-materials, labour, etc., to produce goods and services. It sells goods and services to individuals and to other firms. The firm is an individual organising unit of control of business activity. Considering the legal commitment, the firm may be an individual one, which is owned and controlled by a single person or it may be a partnership firm, owned and controlled by a group of persons, or a corporation, or a co-operative firm. According to different economists, to run a business concern or to start to continue productive activity, the owners of the firm must own some captial goods and other materials required for it. According to Karl Marx and Marxist writers, ownership of capital is an important pre-condition for controlling production.

13.3 Objectives of Firms

The operation of firms has various goals. These have been explained at length by different economists. We shall briefly discuss some of the important objectives of firms.

It has traditionally been known that the maximisation of profits is the main objective of firms. In classical political economy, an entrepreneur or owner of firm is said to be organising a productive activity for the sole goal of maximising profits. However, maximisation of profits is not the only objective of the business firms. Full cost pricing, satisfactory levels of profits, maximisation of sales, marginal utility function and rate of growth are some of the other goals of firms.

13.3.1 Full Cost Pricing

Some economists have challenged the maximisation of profits by firms. According to a group of Oxford economists of the last 1930s, prices are fixed by calculating the average direct cost per unit of output. A reasonable percentage for overhead costs is added to the average direct cost, and the price is then fixed. The firm sells any amount of goods at this price. This procedure is known as 'full cost' pricing. It is not however the same as profit-maximisation in a given short-period situation, in which the firms do not make maximum profits by taking into consideration the calculation of increments of revenues and costs on the margin of production. Firms coordinate their policies on the basis of full-cost pricing. In the long-run, it may have some role in determining profit-maximisation.

13.3.2 Satisfactory Level of Profits

The objective of the firm is not only profit maximisation, but also to earn a satisfactory level of profits. According to H.A. Simon, firms aim at gaining a certain level of satisfactory profits in a

world in which it is not possible to achieve maximum profits. Due to the effects of uncertainty and the lack of full knowledge on the part of consumers regarding the firms' behaviour, firms aim at satisfactory profits instead of maximisation of profits.

13.3.3 Maximisation of Sales

In large firms, management is seperated from ownership. The management pursues policies in their interest rather than in the interests of shareholders. According to Prof. W.J. Baumol the managers take to increasing the size of the organisation, which maximises sales restricted to minimum profitable size, as long as they get the minimum level of profits. The profits are enough to create internal funds and attract external funds for operating the firm successfully, so that the management can be saved from the dissatisfaction of the shareholders.

13.3.4 Managerial Utility Function

As assumed by O.E. Williamson, in the corporation in which ownership is separated, the management would like to operate the firm in such a manner that they would be permitted to spend lavishly on office decoration, costly tours and conspicuous consumption at the dinners. Such types of expenditure is not strictly necessary for the running of a business firm. But they take care to secure more than the minimum profits so as to pay attractive dividends to the shareholders. More than the minimum profits prevent a take-over by another competing and efficient group.

13.3.5 Rate of Growth

Firms also aim at increasing production rather than profit-maximisation. According to R.L. Marcis, the management in corporation takes an interest in increasing the rate of output to meet higher demand instead of increasing the price to respond to favourable demand conditions.

Check Your Progress - 1

1. What is firm?

2. What are the functions of a firm?

3. What are the objectives of a firm?

13.4 Equilibrium of the Firm

When a firm starts producing a comodity, it continues production of it till it receives maximum profits. From this level of output if the firm either expands or contracts its output, it will earn less than maximum profits.

Suppose a firm produces commodity X, it continues the production of X commodity till it reaches a certain level of output say, 100 units of X. At this level of output the firm secures maximum profits. If the firm increases its production beyond 100 units of output of X, the profits will not be at the maximum. If it contracts its output below 100 units of X, the profits will again be reduced. In either of the above two levels of output, the firm will not earn maximum profits. The firm would, therefore not like to change the production from 100 units of output of X. Thus the firm is said to be in equilibrium, where it has no tendency either to increase or to decrease the production when it earns maximum profits.

13.4.1 Assumptions

To explain a firm's equilibrium position, we must assume the following:

1. The entrepreneur is rational and wants to maximise profits,
2. The firm produces only one product.

13.4.2 Total Cost - Total Revenue Criteria

We can discuss the equilibrium of the firm from two points of view one is the 'total cost and the total revenue' approach.. This device is known as the *Break-Even chart*. The Break-Even chart is used for determining the level of output where profits are maximum. Every firm wants to gain more returns on the investments made. If the firm intends to earn huge profits, the difference between the total revenue and the total cost must be the maximum. Table-1 gives the different costs and revenues of the firm under perfect competition. Total fixed costs remain constant, i.e.., Rs. 20/-. The total costs are shown on the total cost curve in Figure 13.1. In the Table, the price is Rs. 20/- per unit and it is fixed for the firm's output. In perfect competition, it can sell any or all of its output at the given market price. The total receipts (revenues) are shown on the striaght line marked TR (total revenue) curve. The last column, of Table-1, shows the profit or the loss.

Table - 1 : Imaginary Schedule of Different Costs and Revenues

No. of Output	Total Fixed Cost	Total Variable Cost	Total Cost (TC)	Marginal Cost (MC)	Average Revenue (AR)	Total Revenue (TR)	Marginal Revenue (MR)	Profit or Loss
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	20	6	26	-	10	10	-	-16
2	20	12	32	6	10	20	10	-12
3	20	17	37	5	10	30	10	-7
4	20	20	**40**	3	10	**40**	10	0
5	20	24	44	4	10	50	10	+6
6	20	29	49	5	10	60	10	+10
7	20	39	**59**	**10**	10	**70**	**10**	+11
8	20	50	70	11	10	80	10	+1 0
9	20	70	**90**	20	10	**90**	10	0
10	20	92	112	22	10	100	10	-12

We can observe from Table-1 and from Figure 13.1 that the entrepreneur earns maximum profits where the difference between total cost and total revenue is maximum. The firm will be in equilibrium when it produces 7 units of output. At this level of output the distance between TR and TC is at the maximum and thus profits are maximised. If the firm produces a few units les than 4 units, the total costs exceed the total receipts. Because, the fixed costs are not distributed over a large number of units to bring the cost per unit below the selling price. But if the firm produces more, the losses come down until a break-even point is reached (at 4 units of output). At this level of output, total revenue is just equal to total cost (Rs.40/-). This is shown in Figure 13.1 at point A,

where the total cost curve and the total revenue curve coincide. If the firm produces more and more goods, the total revenue exceeds the total costs resulting in profit. The profits increase with greater output. Having reached the maximum capacity of the plant,if it increases its production beyond seven units, the profits will decline again. Costs then rise up on the selling price, until profits reduce to zero. In Figure 13.1 if the firm produces 9 units of output, the profits will be zero at point B. If the firm produces beyond this point, B, it will incur losses. Thus the firm will tend to increase its output to that point (i.e., 7 units) at which it earns maximum profits.

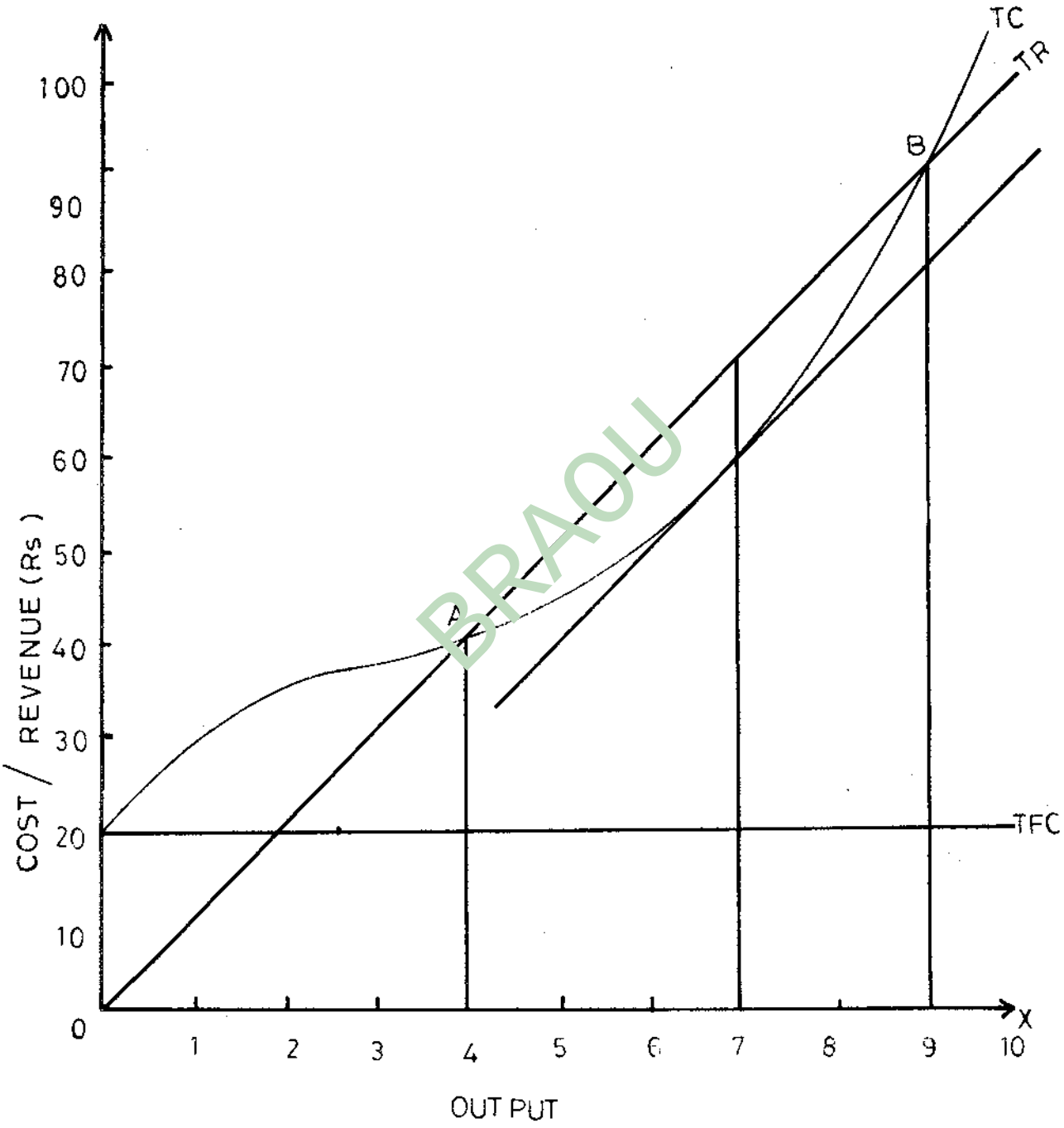


Fig.-13.1: Equilibrium of Firm : From the point of view of Total Cost and Total Revenue

We have to construct a tangent to TC at 7 units of output which is parallel to the TR curve. Thus.the slope of the TR and TC curves at 7 units of output are equal. The slope of the total cost curve indicates marginal cost (MC). The slope of the TR curve is called the MR curve. At the output 7 units, MR = MC. When MR = MC, the profits will be maximum.

13.4.3 Marginal Cost - Marginal Revenue Approach

We can analyse the equilibrium of the firm in terms of marginal revenue and marginal cost. The firm earns maximum profits only at the output 7 units at which MR = MC. If we look at Table-1 we see that the firm gets maximum profits at 7 units of output where MR = MC = Rs. 20/-. If we produce more than 7 units, MC exceeds MR and the firm incurs a loss on each extra unit produced. Loss means that the total profits decrease.

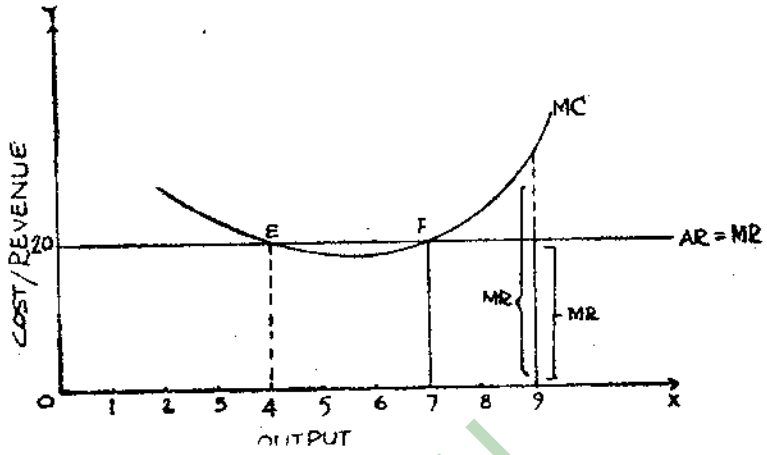


Fig. - 13.2 : Equilibrium of Firm : Marginal Cost and Marginal RevenueCurves

It is shown in the figure 13.2 at 7 units of output that the difference between TC and TR is maximum where profits are maximised. This is also shown in Figure-13.2 in which the MC curve cuts the MR curve from below at the same level of output (7units). The MR is equal to AR in perfect competition, which is horizontal to the X-axis . In this competition, an individual firm cannot influence the market price.The firm can sell any or all of its output at the ruling price. That is why the price for the output is fixed. It is clear from Figure 13.2 that when the output is slightly less than 7 units. MR is greater than MC. Thus the producer increases profits by expanding the output. If the producer increases the output slightly more than 7 units, the MC is greateer than the MR. Thus the firm faces a decline in total profits if the output is increased beyond 7 units. The profits are maximised only when MR = MC.

Conditions for Equilibrium

Two conditions are necessary for a firm to remain in equilibrium. They are :

1) MC = MR

2) The MC curve must cut the MR curve from below the point at which profits are maximised.

13.5 A Representative Firm to show Shut Down Point

In the Figure-13.3 SRMC is the short-run marginal cost curve, SARC is the short-run average cost curve which is the total of the average fixed cost and the average variable cost. SRAVC is the short-run average variable cost curve. In perfect competition, a single firm cannot control prices in

the market. It has to sell its output at the ruling price. In the short run, the firm changes its production by changing variable costs; fixed costs however remain constant. In perfect competition price or average revenue is equal to marginal revenue. The average revenue curve is also a demand curve. Therefore

Price = MR = AR = D.

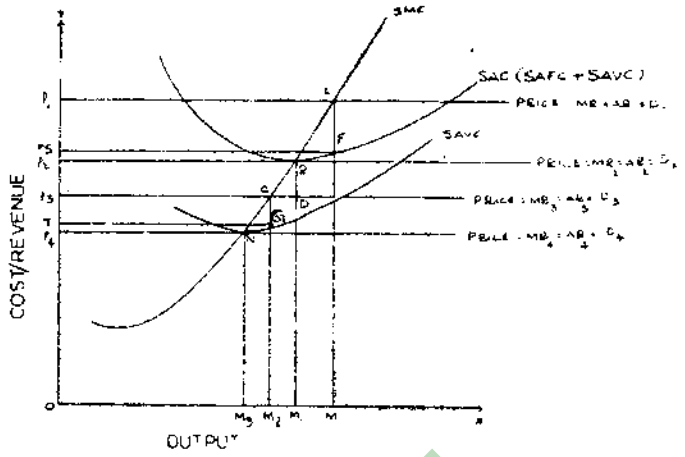


Fig. - 13.3 : A Representative Firm Showing Shut Down Point

N = Shut Down Price; R = Normal Profits

In the Figure-13.3 at ruling price OP_1, the firm intends to produce OM quantity. At OM output, SRMC = MR_1 where profits are maximised. The cost per unit or SRAC is OS. Thus there is a pure profit of SP_1 per unit and total pure profits are the area of rectangle SP_1EF (Profit per unit x Quantity = SP_1 x SF (OM). These are abnormal profits earned at the level of output OM. In figure 13.3 at output OM, SRMC = $MR_1 = P_1(AR_1)$ > SRAC > SRAVC.

If the market price falls to P_2 the firm is in equilibrium at point R at the output OM_1, where $MR_2 = AR_2$ = SRMC. At OM_1, average cost is equal to average revenue so the firm is making only normal profits. The point R is called the point of normal profits. If the price falls to P_3 where $MR_3 = AR_3 = D_3$, when price is P_3 SRMC cuts MR_2 from below at point C at which the firm is in equilibrium. Here the firm no longer covers the entire fixed costs of production. If it shuts down, it would have to bear the fixed costs "from the pocket". At the output OM_2, the average variable cost is M_2D or OT. At this price OP_3 the total revenue is OP_3 X OM_2 = the area of rectangle OP_3CM_2, which is greater than the total variable cost of the area of the rectangle $OTGM_2$ [OT(AVC) X OM_2 (output)]. Here, the firm is covering its variable costs plus some of its fixed costs, and so it is better off operating than if it were shut down.

If price still falls to P_4 (= $MR_4 = AR_4 = D_4$), the firm is in equilibrium at point N, where MR_4 = SRMC or MR_4 = MC, here the firm is covering only its variable costs but not any of its fixed costs. The firm does not know whether to operate or close down at this output OM_3. Output OM_3 is the **shut down point**, where the marginal revenue is equal to the marginal cost and the average variable cost – MR = MC = AVC. If the price is reduced further below P_4, the firm will shut down because it will incur a loss by operating production at that price.

Let us examine the profit-maximising criteria. In the short run MC must cut MR from below (where MC = MR) while the marginal cost is rising. The formula is MC = MR = Price. This is true only in the purely competitive situation.

The marginal cost curve is the short-run curve for the purely competitive firm. The curve indicates the quantity the firm is willing to supply at various prices. That is why the average variable cost is of considerable importance in the short run.

Check Your Progress - 2

4. List the two conditions for a firm to be in equilibrium.

5. Draw the TC and TR curves on a graph, and show the equilibrium point on it.

6. What is MC – MR approach?

7. What is shut-down point?

13.6 Summing up

The unit has introduced the concept of firm and explained two approches through which a firm gets equilibrium. A firm, which is an individual organising unit of control of business activity, has a basic objective in maximising its profits. Equilibrium of the firm is discussed from two view points. Maximising the difference between total revenue and total cost is the first approach. Equalisation of marginal cost with marginal revenue is the other approach. This view - point needs two conditions to be fullfilled.

If a firm covers only its variable costs but not any of its fixed costs to produce a commodity, it prefers to close down its operation. Here MR = MC = AVC. At this point if a firm operates its production, depreciation on its fixed cost will not be covered. Hence this point is called the shut-down point. This is analysed diagrammatically in the last part of the unit.

- Sri P. Rajesham

13.7 Suggested Books

!. A. Koutsoyiannis : Modern Micro Economics

2. Stonier and Hague : A Text Book of Economic Theory.

13.8 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is meant by 'firm'? Explain the major objectives of 'firm'.
2. What is the equilibrium of the firm? Explain the equilibrium of a firm from the point of view of total cost and total revenue.
3. Explain diagrammatically the equilibrium of a firm from the point of view of marginal cost and marginal revenue.

II. Answer each of the following questions in about 15 lines.

1. Explain the important objectives of firms.
2. Explain and illustrate diagrammatically the equilibrium of a representative firm.
3. What is 'shut-down point' ? Explain it graphically.
4. What are the conditions for a firm to be in equilibrium ?

BLOCK - V

MARKET STRUCTURE ANALYSIS

We have learnt the analyses of revenue and costs and also the equilibrium of firm in the earlier block. Now let us try to introduce the concept of market and different forms of market. This block concentrates on two major market situations, namely perfect competition and monopoly. The concepts of monopolistic competition, oligopoly and duopoly are explained in brief. Markets can be classified into different forms on the basis of are, time and nature of competition. Equilibrium of price is discussed in different demand and supply conditions. Price determination is analysed in different periods viz., market period, short- period and long-period. The Unit-15 deals with the characteristics of perfect competition and equilibrium of firm and industry in perfect competition in short and long run. Unit -16 discusses different kinds of monopoly and price determination in simple monopoly and discrimating monopoly.

This block has following 3 units :

Unit - 14 : Concept of the Market Determination of Price
Unit - 15 : Perfect Competition
Unit - 16 : Monopoly and Imperfect Competition

Unit - 14 : Concept of the Market - Determination of Price

Contents

14.0 Aims and Objectives

The purpose of the unit is to explain the meaning, elements and different forms of markets and the determination of price of a product under different periods, such as market period, short-run period and long-run period.

After reading this unit, you will be able to

* define the market,
* list the elements of the markets,

* Classify the markets of the basis of area, time and nature of competition,
* emphasize the importance of time element in price theory,
* determine the prices under different time periods, viz., market period, short period and long period, and
* differentiate the market price from normal price.

14.1 Meaning of Market

The term 'market' is an elusive concept. The word is generally used to describe the process of exchange. The process of exchange always involves certain elements such as goods or services, buyers, place and time.

"Originally" says Jevons," a market was public place in a town where provisions and other objects were exposed for sale; but the word has been generalised so as to mean *any body of persons who are in intimate business relations and carry on extensive transactions in any commodity.* A great city may contain as many markets as there are important branches of trade and these markets may or may not be localised. But *the idea of locality is not necessary*. The traders may be shared over a whole town, or region, or a country and yet form a market, if they are, by means of fairs, meetings, published price lists, the post office or otherwise, in close communication with each other".

According to Cournot, a French economist "economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same goods tends to equality easily and quickly."

14.2 Elements of Market

Some elements of markets are: (1) there must be a commodity which is to be dealt with; (2) there must be buyers and sellers; (3) there must be a place, be it a certain province, a country or the entire world, where the process of exchange takes place; (4) there must be inter-course between buyers and sellers. For example in a vegetable market, the buyers and sellers usually meet and an exchange takes place between them. But in a share market or foreign exchange market, the buyers and sellers may not see each other face to face, and transactions still take place through different modes of communication. Thus there are certain goods which are marketed locally, but there are certain other articles like shares and foreign exchange that can be and their domain of operation may be spread throughout the world. These goods have an international market.

Check Your Progress - I

1. *What is market in economic ?*
2. *What are the elements of market ?*

14.3 Classification of Markets

we may classfy markets into three categories according to factors such as area, time and nature of competition.

14.3.1 On the Basis of Area

Markets may be categorized on the basis of are. They may be further classified into:

(a) *Local Markets*- such as weekly fairs in villages and daily transactions in consumer goods in towns:

(b) National Markets- dealing in articles which have demand throughout the country like tooth pastes, medicines and television sets :

(c) International Markets - There are certain commodities the transactions of which are carried on throughout the world. For example, Indian jute goods, etc.

14.3.2 On the Basis of Time

Markets may be classified on the basis of time. We further classfy these markets into:

a) Very Short Period Market
b) Short period Market
c) Long Period of Secular Markets which cover a generation.

14.3.3 On the Basis of Nature of Competition

On the basis of nature of competition, markets are classified into two as those with perfect and imperfect competition. We shall discuss them briefly here. They will be dealt with in detail later.

a) Perfect Competition: There are huge numbers of buyers and sellers in the market. Buyers and sellers are aware of the prices at which transactions take place. For a commodity the same price prevails uniformly throughout the market. No individual seller or buyer can influence the price in the market. The market for perishable goods like vegetables, eggs, etc., to a certain extent resembles this type of competition.

b) Imperfect Competition: There are a large number of buyers and sellers but fewer than the number of buyers and sellers in perfect competition. The buyers and sellers are not aware of the offers made by others. Naturally, the same price cannot prevail for the same commodity at the same time in imperfect competition. Goods are not homogeneous and are not perfect substitutes. That is why the price will not be the same for the same commodity throughout the market, whereas in perfect competition, the same price prevails throughout the market.

Check Your Progress - 2

3. *Classfy the markets on the basis of area.*
4. *Classfy the markets on the basis of nature of competition.*

14.4 Equilibrium Price

The buyers and sellers in the market bargain about goods and services. They agree to purchase and sell goods and services at a certain price. In this manner the price is determined by the interaction of buyers and sellers. In other words, demand and supply determine prices.

Buyers in the market follow the law of demand. The Law of demand reveals that when the price falls the demand increases and when the price rises the demand decreases. The sellers follow the *law of supply*. According to this law, when the price rises the supply is increased and when the price falls the supply is decreased. Thus, demand and supply move in opposite directions. Price is determined by the interaction of demand and supply and the price at which demand and supply are equal is known as the *equilibrium price*. *Equilibrium quantity* is the quantity supplied and the quantity demanded at equilibrium price. If the price is more or less than the equilibrium price, the equilibrium output is disturbed. But ultimately the quantity demanded and the quantity supplied will be balanced at some equilibrium price. We can explain this process of reciprocity with the help of a schedule and figure. In the Table-1 the quantity demanded and supplied is shown.

Table -1 : Quantity Demanded and Supplied (in kgs)

	Price	Quantity Quantity	Supplied	
	2	200	50	
	3	150	75	
	4	130	100	
Equilibrium price	**5**	**110**	**110**	Equilibrium quantity
	6	90	120	
	7	80	130	

When the price of mangoes is Rs. 2/- per Kg., the demand for them is 200 kgs but the quantity supplied is 50 Kg. If the price rises to Rs. 3/- the supply increases to 75 Kgs, where as the demand falls to 150. If the price is again raised, the supply will increase to 100 and the demand will be further reduced to 130 Kg. Again, when the price goes up to Rs.5/- per Kg. the quantity demanded or supplied is 110 Kg. At a price of Rs.5/- per Kg. the buyers are ready to purchase 110 Kgs and the sellers are ready to offer 110 Kgs. This is the equilibrium price and the quantity supplied at this price is called the equilibrium quantity, i.e., 110 Kgs. Once the equilibrium price is determined there is not tendency to change from this price as this satisfies both the consumers and the producers. If at any time, the price is more or less than Rs.5/- the forces of demand and supply will adjust it back to Rs.5/-. For instance, if the price increases to Rs.6/- the quantity demanded is decreased, but the quantity supplied is increased. At Rs.6/-, the demand will be 90Kgs and the supply will be 120 Kgs. When the supply is greater than the demand, the seller has to reduce the price to Rs.5/- As a result, the supply will fall to 110 Kg. and demand will also increase to 110 Kgs. Thus, the equilibrium price is re-established. On the contrary, if the price decreases to Rs.4/-, the demand will increase to 130 Kgs. The supply will fall to 100Kgs. Here then supply is less than the demand. Decreased supply and an increased demand will lead to a rise in the price to Rs.5/- where the demand and supply will be in equilibrium. In this manner the equilibrium is maintained again.

In Figure-14.1 DD is the demand curve and SS is the supply curve. These two curves intersect at point E. The point, at which demand equals supply is called the equilibrium point. OP is the equilibrium price at which OM, the equilibrium quantity, is demanded and supplied. If demand is less than supply, every seller will try to sell his quantity of the product first by reducing the price a little. Sellers compete among themselves to bring down the price to the equilibrium level. Thus demand and supply determine the equilibrium price. Once it is established, any disturbance from this equilibrium level will be restored by the forces of demand and supply.

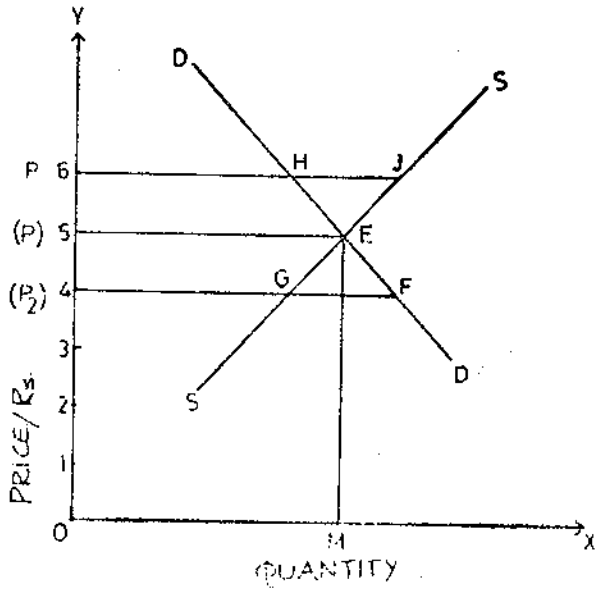


Fig. 14.1 Equilibrium Price

Check Your Progress - 3

5. *What is equilibrium price?*

6. *How is price determined?*

7. *What is equilibrium quantity?*

8. *What is law of demand?*

9. *What is law of supply?*

10. *Depect the equilibrium price and equilibrium quantity through a diagram.*

14.5 Effects of Changes in Demand and Supply on Equilibrium Price

Changes in demand and supply bring about changes in the equilibrium price level and the equilibrium quantity. When there is a change in either the demand or the supply or both, a new equilibrium price is established. Thus, whenever change in either demand or supply takes place, a new equilibrium price is determined.

14.5.1 Effects of Changes in Demand

There are some conditions which bring about changes in demand. A change in incomes, tastes, prices of substitute goods and preferences of consumers will lead to a change in demand. Figure-14.2 shows the effects of a change in demand and the resultant equilibrium price and quantity. DD is the demand curve and SS is the supply curve. The Supply curve remains the same. The DD

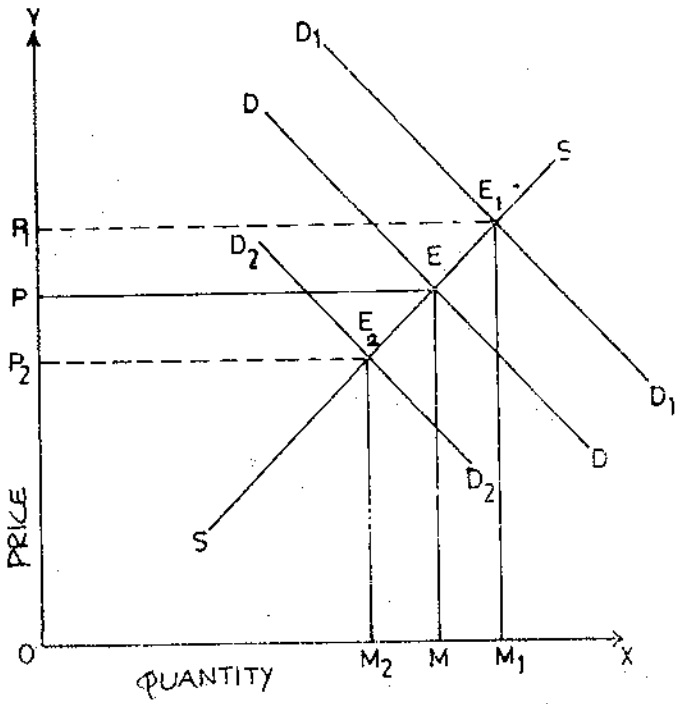


Fig. 14.2 Equilibrium Price : Effects of Changes in Demand

and SScurves intersect at point E and the quantity demanded and supplied is OM at OP equilibrium price. Given the supply, if the demand increases the demand curve shifts upward to the right. Due to a change in demand, the demand curve D_1D_1 intersects SS supply curve at point E_1. The equilibrium price is increased from OP to OP_1 and the equilibrium quantity from OM to OM_1. On the other hand, if demand falls, the demand curve shifts downward to the left. Due to a change in demand, the curve D_2D_2 intersects the supply curve SS at point E_2. The equilibrium price is OP_2 which has decreased from OP to OP_2 and the equilibrium quantity has decreased from OM to OM_2. Supply being given, a decrease in demand reduces both the price and the quantity and vice versa.

14.5.2 Effects of Changes in Supply

Changes in supply are brought by changes in technical knowledge and factor prices. Figure-14.3 explains the effects of changes in supply. Demand being given, the supply curve is SS

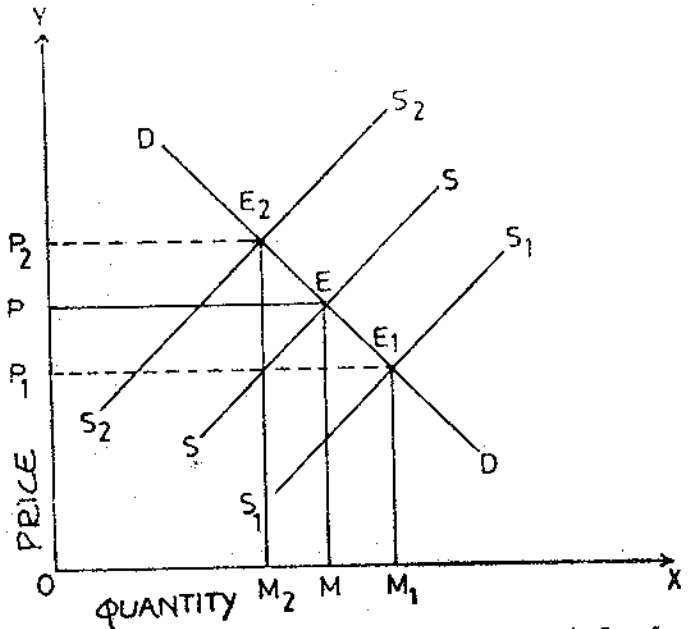


Fig. 14.3 Equilibrium Price : Effects of Changes in Supply

demand curve is DD. SS and DD intersect at point E, where supply and demand are equal at OM quantity at OP equilibrium price. Given the demand, if the supply increases, the supply curve shifts to the right S_1S_1. The new supply curve, which intersects DD curve at E_1, reduces the equilibrium price from OP to OP_1 and increases the equilibrium quantity from OM to OM_1. On the contrary when the supply falls, the supply curve moves to the left (S_2S_2) and cuts the DD curve at point E_2 at which the equilibrium price is raised from OP to OP_2 reducing the equilibrium quantity fromOM to OM_2.

14.5.3 Effects of Combined Changes in Demand and Supply

Now we shall study the effects of combined increase and/or decrease in demand and supply.

When both demand and supply increase, the quantity of the product will increase definitely. But it is not certain whether the price will rise or fall. If an increase in demand is more than an increase in supply, then the price goes up. On the other hand, if an increase in supply is more than an increase in demand, the price falls but the quantity increases. If the increase in demand and supply is same, then the price remains the same.

When demand and supply decline, the quantity decreases. But the change in price will depend upon the relative fall in demand and supply. When the fall in demand is more than the fall in supply, the price decreases. On the other hand, when the fall in supply is more than the fall in demand, the price rises. If both demand and supply decline inthe same ratio, there is no change in the equilibrium price, but the quantity decreases.

If the increase in demand is greater than the decrease in supply the price rises. If the decreasse in supply is greater than the increase in demand, then also the price increases. If the increase in demand is exactly equal to the decrease in supply, then the price rises, but the equilibrium quantity remains the same.

Thus the price is determined at the point where both demand and ssupply cut each other. The only really accurate answer to the question whether it is supply or demand which determines price, is that it is infact both. At times it will seem that one is more important than the other, for one will be active and the other passive. For example, if demand remains constant but supply conditions vary, it is demand which is passive and supply, active. But neither is more or less important than the other in determining price.

Check Your Progress - 4

11. How does a decline in demand and supply affect price and quantity?

12. Explain the effect of an increase in demand and supply on quantity and price.

14.6 Importance of Time Element in Price Theory

The forces of demand and ssupply determine price. The influence of time on the determination of price was first recognised by Marshall. When the demand for a commodity changes, its supply will also change. But the changes in demand and supply will not be possible at the same time. For example, an increase in demand will possible only after some time. The supply will take time to adjust itself to a change in demand. Moreover, supply is based on costs of production, which change over time. In the short period, it is not possible to change the size of a firm, as costs of production

are high. In the long -run there is enough time to change the size of the firm to any extent as it should be able to produce at a lower cost. Hence, the element of time is very important in the determination of the price of a commodity. Marshall indicates that there are four periods in the theory of value. (1) The Market Period or Very Short Period, (2) The Short Period, (3) The Long Period, and (4) The Very Long Period or the Secular Period. Here we shall discuss only the first three types. Marshall classidied the periods in terms of operations, or in terms of the period required for economic forces to work. *Market Period* is one in which there is no time to change the supply of the product. The *Short Period* refers to a period inwhich the supply can be changed to some extent without changing the size of the firm. The *Long Period* is that which is long enough to adjust the supply even by altering the size of the plant to meet changes in demand.

14.7 Price Determination in the Market Period

Market period is a very short period, in which the production is neither decreased nor increased. In other words, the supply of the product remains fixed. Here the nature of commodity plays its role in the determination of price. Certain commodities are *perishable* in nature, such as fish, vegetables, flowers, and cannot last long or cannot stay fresh for more than a few days, or for some times in a day. That is why they must be sold within a short period, say a day (market time). Otherwise they will deteriorate; there will be no demand for them after a particular time is over. In the above case, the supply curve of the goods is a vertical line as depicited in Figure-14.4.

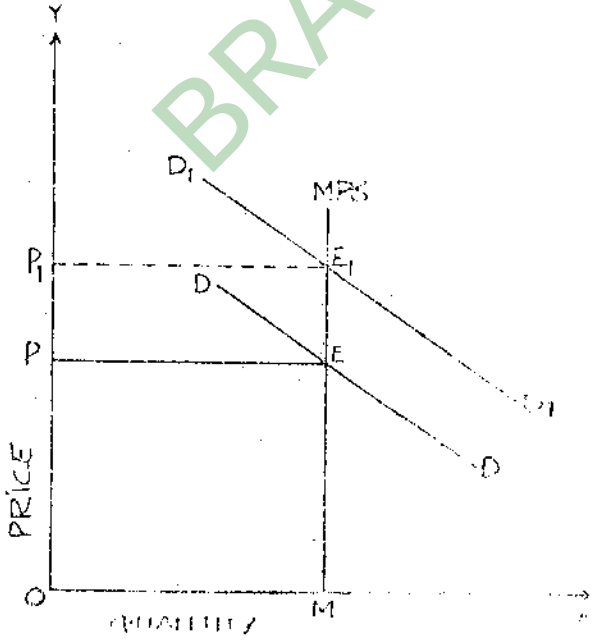


Fig. - 14.4 : Market Period Price Determination: Perishable Goods

The vertical supply curve reveals that the supply of goods which are to be sold in the market at any price is fixed. While there is no change in the supply, there may be changes in demand in the market period. In this situation, demand determines the price. If demand is more in the market, a higher price will prevail and vice versa. MPS is the market period supply curve,which is fixed. DD is the demand curve. DD intersects the MPS curve at point E and OP is the equilibrium price. If

demand increases, supply being constant, the price increases. D_1D_1 is the increased demand curve which cuts MPS at point E_1. The equilibrium price increases from OP to OP_1 which is higher than the initial price. This shows that supply being fixed, demand has full influence on the determination of the price of the product.

Non-perishable goods, unlike perishable goods, can be stored. Such goods will have a reservation price, below which the producer will not like to sell them. The cost of production of a commodity influences the reservation price. In the market period, all costs are fixed and fixed costs do not influence prices. In the market period, supply is fixed and changes in demand exert an influence on the determination of price. But according to Marshall even inthe market period in the case of durable goods, both supply and demand are equally required for the determination of price. The firm will sell no commodity below its reservation price. This is shown in Figure-14.5. The market period supply curve is MPS for durable goods. This curve indicates that nothing can be sold below the reservation price OS.

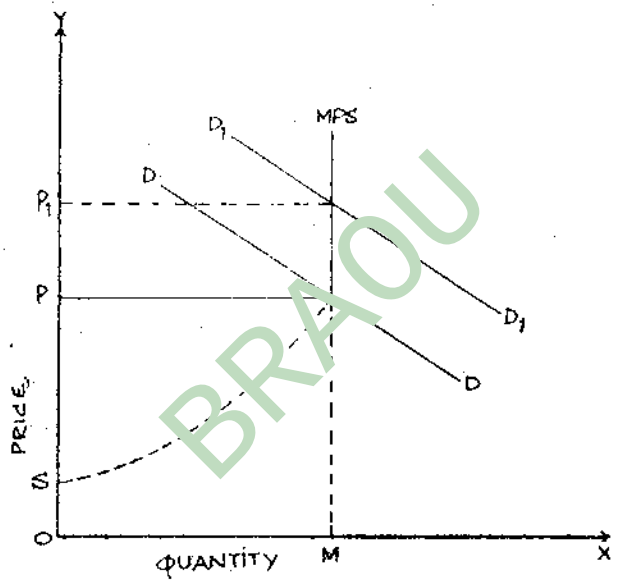


Fig. - 14.5 : Market Price Determination : Non-Perishable Goods

DD is the demand curve which interacts with MPS at point E. The market price is OP at which the whole production is supplied. Below this price OP, or from the reservation price OS, as demand increases supply is also increased upto OP the market price. In the market period,if demand increases further, the supply remains fixed at OM level but the price rises. D_1D_1 is the changed demand curve which intersects the vertical part of the MPS curve at point E_1 where price is increased from OP to OP_1. This will occur in the case of durables and semi-durables.

Check Your Progress - 5

13. What is market price?

14. What is short - period?

15. What is long - period?

16. What are perishable goods?

14.8 Price Determination in the Short Period : Short - Run Normal Price

Short- run is the period in which a firm varies its output by changing variable factors, while fixed factors remain constant. In the short-run period, if a firm wants to increase or decrease its production it will employ more labour, raw-materials, etc., or less labour, raw-materials, etc., to match the increase or decrease in demand. But fixed factors or the size of the plant remain same.

In the short-run, the forces of supply and demand determine the price. The supply curve will rise upwards from left to right. The price at which the demand and supply curves intersect each other is known as the *short-run equilibrium price*. The short-run price is also called the *short-run normal price*. It is illustrated in Figure-14.6

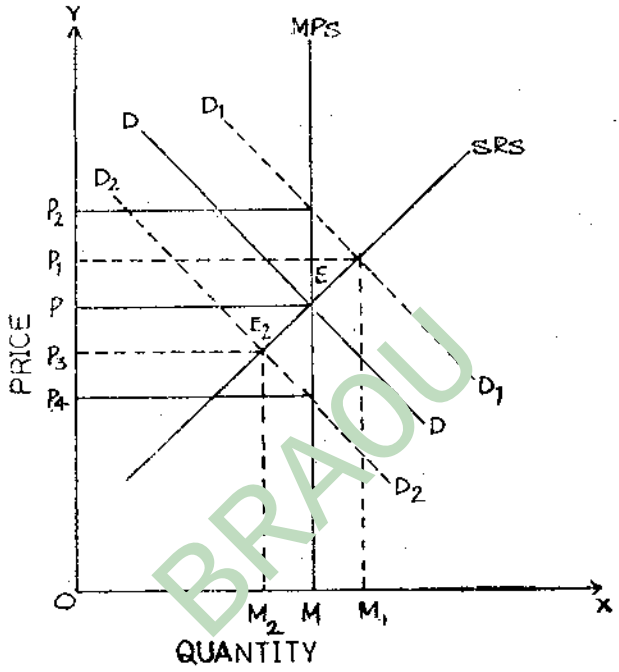


Fig. - 14.6 : Price Determination in Short Period

MPS is the market period supply curve and DD is the demand curve, which intersects MPS at E, and OP price and OM quantity are established. If the demand for the product rises, this is shown by the demand curve D_1D_1. In the market period the supply is fixed and it is not possible to increase the production beyond OM. That is why, the market price will immediately be increased from OP to OP_2. But in the short period, it is possible to increase the production with the help of existing plant capacity by employing more labour, raw-materials, etc. Thus the supply will be increased along the SRS (short run supply) curve by increasing the variable capital. D_1D_1 is a new demand curve. The SRS curve intersects D_1D_1. The short-run normal price is OP_1 at equilibrium quantity OM_1. This price OP_1 is higher than the original market price (OP) but is lower than the market price OP_2 after the increased demand.

Check Your Progress - 6

17. What is short run?

18. What is short run market price?

14.9 Price Determination in the Long Period : Long-Run Normal Price

Long-run is such a long period that in it production may be changed by varying the fixed as well as the variable factors. In the long period, supply fully adjusts itself to the changes in demand. The long period demand and long period supply of the industry determine the normal price of a product.

In the long period there is sufficient time for new firms to enter the industry and for old firms to leave the industry. When the firms in the industry are earning more than normal profits, new firms enter the industry so that production increases and brings the price down to the original normal price. When firms in the industry are incurring losses, some old firms leave the industry, due to which production decreases. This results in raising the price to the original normal price. The long run new price may be equal to or less or more than the initial price. It depends on the laws of returns of the industry. If the industry is operating under increasing cost conditions or diminishing returns, the normal price is higher than the original price. If it is operating under decreasing cost conditions or increasing returns, the normal price is lower than the original price. If it is operating under constant cost conditions or constant returns, the normal price is equal to the original price. Thus there is no change in normal price in constant returns.

We shall discuss below the determination of the long period normal price under various cost conditions.

14.9.1 Long-Run Normal Price in Increasing Cost Industry

If the industry is operating under increasing cost conditions the long-run supply curve of the industry will rise upwards to the right as production increases.

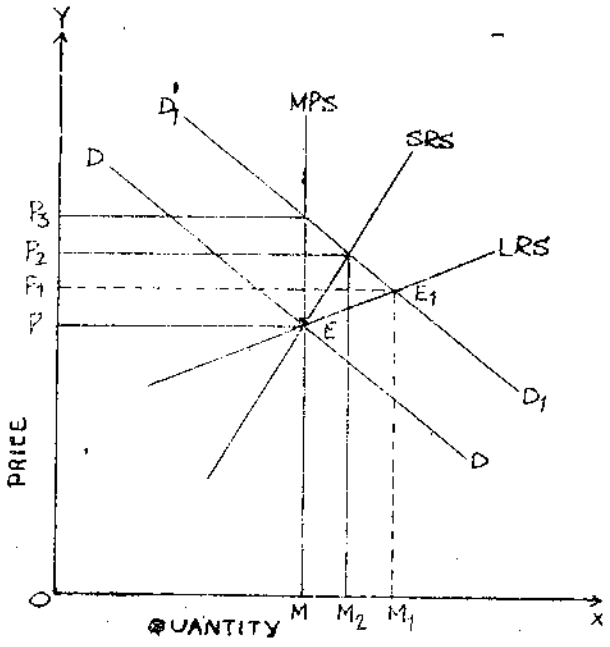


Fig. - 14.7 : Long Period Equilibrium Price Determination in Increasing Cost Industry

In figure-14.7 LRS is the long run supply curve, SRS is the short run supply curve and MPS is the market period supply curve. DD is the industry demand curve which intersects LRS, SRS, and MPS at E. At this point the industry is supplying OM output at OP equilibrium price. If the demand curve shifts upwards from DD to D_1D_1 inthe short period, due to the increase in demand, the industry increases its supply to OM_2 level of output by increasing only the variable factors at OP_2 price. But in the long run, the industry can fully adjust the supply to the increase in demand by changing the fixed as well as the variable factors of the firm. In the lond run new firms will also enter the industry. The industry will increase its supply to OM_1 which is more than the increase in supply in the short run. The new equilibrium price OP_1 is established where D_1D_1 intersects LRS at E_1 at which equilibrium output is OM_1. The long run equilibrium price OP_1 is more than the initial price OP. But the long run rquilibrium price OP_1 at output OM_1 is less than the short run equilibrium price OP_2 at OM_2 output and market price OP_3 at OM output.

14.9.2 Long-Run Normal Price in Constant Cost Industry

If the industry is operating under constant cost conditions, the long run supply curve of the industry is horizontal to the OX-axis as illustrated in Figure 14.8 by the LRS straight line. DD is the industry demand curve which cuts LRS, SRS and MPS at point E. The equilibrium price is OP at OM equilibrium output. If the demand curve shifts to D_1D_1, the supply is increased to OM_2 due to increase in demand in the short run, the equilibrium price is increased from OP to OP_1. In the long run there is sufficient time to increase the scale of the plant. The long run industry demand curve D_1D_1 intersects LRS at E_1, where the equilibrium output is OM_1 at OP equilibrium price. LRS is horizontal to the OX-axis. This shows that under constant cost conditions, the long period normal price is the same as the initial price whether the output increases or decreases. Thus it remains at the same level as it was in the short run.

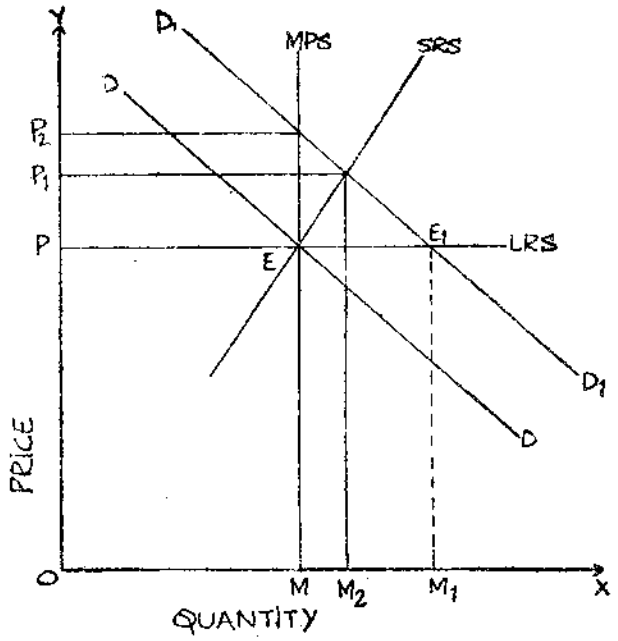


Fig. - 14.8 : Long - Run Equilibrium Price in Constant Cost Industry

14.9.3 Long-Run Normal Price in Decreasing Cost Industry

If the industry is operating under decreasing cost conditions, the supply curve in the long run will slope downwards. In the long run, as the industry expands it will enjoy the advantage of external economies, which lead to the firm's cost curves shifting downwards. While in the short run the price will increase as a result of increased demand, in the long run the price is less than the initial price.

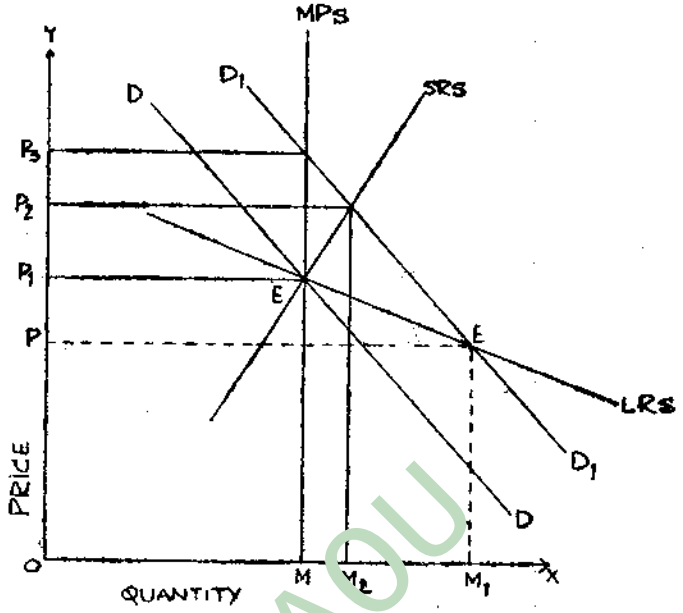


Fig. - 14.9 : Long-run Price in Decreasing Cost Industry

In Figure-14.9, DD is the original demand curve, which cuts MPS, SRS and LRS at E. At this point, the equilibrium price is OP_1 and the output bought and sold is OM. If the demand curve shifts to the right, it intersects LRS at E_1 in the long run. In the long run, as demand increases, the equilibrium price OP is less than the original price OP_1 which is the result of increasing returns to scale. But the output bought and sold is increased, from OM to OM_1. In the short period, as demand is increased, the supply is also increased but less than the increase in supply in the long run. That is why the price is higher than the original price in the short run.

In the long period, it is obvious that the normal price is higher, lower or the same as compared with that of the initial market price. This depends on the cost conditions of the industry in question. It also depends on internal economies or dis-economies and external economies or dis-economies. However, in the short run, the normal price will invariably be higher than the long run normal price.

14.10 Comparison of Market Price and Normal Price

a) Market price prevails in a market on a single day or in very few days. It prevails at *a particular time*. Normal price tends to privail in the long run. It has a tendency to prevail *over a period of time*.

b) Demand is important in the determination of market price while supply is passive. As demand increases or decreases, the market price goes up or comes down, while supply is fixed. On the other

hand, the determination of normal price depends more on the role of supply which tries to adjust itself fully to any change in demand.

c) Market price may vary many times in a day or a week as a result of passing events and temporary events which influence it greatly. For example, if there is a bandh on a particular day, the price of perishable goods may shoot up. But it is only a temporary phenomenon as the very next day they may come to normalcy again.

Market price is a temporary price. In the long run, demand and supply may be changed by permanent forces. The changes in demand and suply determine normal price. That is why normal price is permanent and stable. Market price oscillates around normal price.

d) In the long-run, normal price always coincides with the long run average cost at its minimum point. Therefore, firms gain only normal price.

e) All commodities have a market-price. The goods which are produced again and again have a normal price. Non-supply of such goods can be increased in the long-run to adjust increases in demand. Non-reproducible goods such as collections of rare coins and paintings etc. cannot have a normal price, but they have a market price. The supply of such goods cannot be increased.

f) Normal price is not a real one whereas market price is real. Normal price may occur when demand equals the changes in supply in the long run. But these changes may not be same in the long run. Changes in demand may be more or less than changes in supply. That is why normal price is never arrived at in the long run. In practice, a long period normal price is never arrived at. There is usually a change in some of the conditions underlying the long period equilibrium before it has had time to come into being. The price which is existing in the market is always the market price rather than the normal price.

Check Your Progress - 7

19. What is long run normal price?

20. What is long run?

21. What are the contrasting points between market price and normal price?

14.11 Summing Up

Market is explained as a process of exchange of goods or services from sellers to buyers. Every commodity will have its own market. On the basis of area, time and nature of competition, market s are classified. In the market, quantity demanded and quantity supplied determines the price. Equilibrium price is achieved if demand and supply are equal. If price is changed, the changes in supply and demand bring back the equilibrium. Changes in demand and supply affect the equilibrium price and equilibrium quantity.

The importance of time element in price theory is explained by Prof. Marshall. He explained about four periods: market period, short period, long period and very long period. This unit has dealt with the first three periods. How the price is determined in the three markets is explained in the unit. In the market period, demand affects the price. In the short run, the forces of demand and also supply determine the price. But supply depends on variable inputs only. Fixed capital can not be changed in

the short period. In the long run, there will not be any fixed capital as fixed factors can be changed. Therefore, in the long period, supply and demand forces determine the price, where supply becomes an active variable.

In the end , the unit differentiates the market price from normal price. Market price prevails in the market period,i.e., at a particular time while normal price prevails over a period of time i.e., in the long run. Demand affects the market price where supply is a passive variable. Supply is the major force in determining the normal price.

- Sri. P. Rajesham

14.12 Suggested Books

1. A. Koutsoyiannis: Modern Micro Economics
2. H.S. Agarwal : Principles of Economics
3. Stonier and Hague: A Text Book of Economic Theory.

14.13 Model Examination Questions

I. Answer each of the following questions in about 30 lines

1. What is equilibrium price? How is it determined at different demand and supply conditions?
2. What is meant by market in economics? Classify the markets.
3. Explain the price determination in market period and short period.
4. Explain the determination of the long run normal price under various cost conditions.

II. Answer each of the following questions in about 15 lines.

1. Explain the importance of time element in price-theory.
2. What is market period? Explain the price determination in the market period.
3. What is normal price? How is it determined in the short run?
4. Explain the price determination under the long-run.

Unit - 15 : Perfect Competition

Contents

15.0 Aims and Objectives

The unit describes the characteristics of perfect competition ; conditions and assumptions of equilibrium of the firm; and it also explains how the firm and industry get equilibrium in different market conditions.

After reading the unit you will be able to

* identify the characteristics of perfect competition,
* compare perfect competition with pure competition,
* list the conditions and assumptions under which a firm attains equilibrium,

* interpret the equilibrium position in short-run under different profit / loss situations,
* explain the equilibrium in long-run, and
* demonstrate the point of optimum firm.

15.1 Introduction

In Block IV we have discussed cost and revenue curves. We shall use these curves in discussing the equilibrium of firms and industries. These curves show how the firm reaches equilibrium under different conditions. In the previous unit, we studied about equilibrium in general. In this unit, we shall deal with the equilibrium of a firm or industry in the short-run and in the long-run, in conditions of perfect competition.

15.2 Meaning of Perfect Competition

In perfect competition there are a large number of buyers and sellers. The sellers sell homogeneous products and the buyers as well as sellers have perfect knowledge about the market. According to John Robinson, "Perfect competition prevails when the demand for the output of each producer is perfectly elastic. This entails first, that the number of sellers is large, so that the output of the commodity, and second, that buyers are all alike in respect of their choice between rival sellers, so that the market is perfect".

15.3 Characteristics of Perfect Competition

15.3.1 A Huge Number of Buyers and Sellers

There must be huge number of buyers and sellers in the market. Any one seller or buyer cannot influence the ruling price in the market. Each buyer's demand is a negligible part of the total market demand. The individual buyer's activity will have no control on the market price. Similarly as there are a huge number of firms, each firm's output forms a very small fraction of total output and cannot influence the market price. That is why each individual buyer and producer will have to accept the ruling price. In other words, the firm is a 'price taker', but not a 'price giver'. Hence, the demand curve for the product will be perfectly elastic at the existing price and the demand for the quantity of the product will be as per its sale.

15.3.2 Homogeneous Product

In perfect competition, the product produced by all firms is identical. A commodity produced by one firm is the same as that produced by another firm. The quantity and quality, colour and weight of the product produced by various firms are the same. That is why the buyers in the market are indifferent to the firm when they go to purchase their commodities. Similarly the producers are indifferent to the buyers to whom they sell. The consumer feels no difference whether he buys the commodity from one firm or another in the industry, because the commodity is identical. Hence, there is a single price for the product in the market. In perfect competition, there is absolute elasticity of demand. In other words, the demand curve is a straight line horizontal to the OX-axis. The demand curve or the average revenue curve and the shape of marginal revenue are the same.

15.3.3 Horizontal Shape of Demand curve

In perfect competition, the average revenue curve or demand curve of a firm will be a horizontal straight line which is parallel to the OX-axis. This type of demand curve indicates perfect elasticity of demand which means that any firm can sell any quantity at theexisting price. As there are huge number of firms in the market, market price cannot be influenced by an individual firm. Since homogeneous commodities are produced by various firms, the price paid by the consumers cannot be different. This can be illustrated with the help of diagram as shown below.

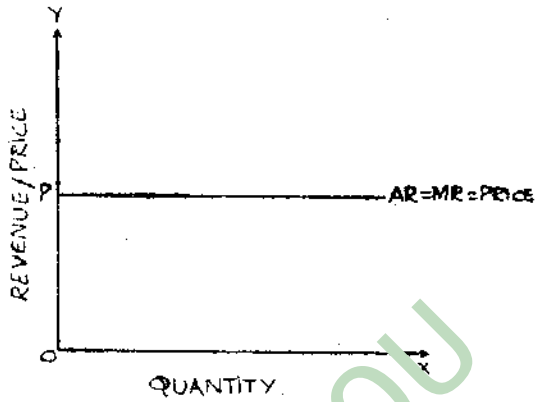


Fig - 15.1 : Shape of Demand or Average Curve of a Firm Under Perfect Competion

Price and revenue are measured on 'OY' -axis . Quantity is measured along the OX-axis. At price OP the producers sell as much as they like. Because at OP price the demand curve is perfectly elastic, the producers offer as many goods as they can. Neither can the price be increased nor decreased. If the price is increased, the sellers lose their customers.

We have discussed three conditions which are necessary for ***pure competition*** *to exist. We find pure competition for agricultural goods such as rice, wheat, etc. In other sectors, We rarely come across pure competition. In adition to the three conditions mentioned above, certain other features must be required to create perfect competition. Let us discuss about them.*

15.3.4 Free Entry and Free Exit

In perfect competition, there are numerous firms in the industry. Any firm can expand its production or a new firm may be set up when the firms in the industry are making abnormal profits in the short-run. No restriction is imposed on the expansion of existing firms or the installation of new firms. Producers are also at liberty to curtail the firm's scale of production. Complete freedom prevails in perfect competition for entry into an indusry or exit from it. In the long-run all the firms earn normal profits and no firm either leaves the industry or enters into the industry. In the circumstances each firm operates at an optimum output in the long-run.

15.35 Perfect Mobility of Factors of Production

Factors of Production such as labour and capital have perfect mobility in perfect competition. Workers go from one productive activity to another productive activity. Similarly entrepreneurs move

from one industry to another industry so that they can earn more income. In this manner each factory owner earns its opportunity cost in a perfect competition.

15.3.6 Absence of Transport Cost

There are no transport costs in perfect competition. To have the same price for the same product through out the market, it is essential that the transport costs incurred for carrying the product from one place to another should not be added to its price. If the transport costs are added to its price, even homogeneous products will not have the same price due to the distance from which they are transported to the market.

15.3.7 Perfect Knowledge of Market Conditions

The buyers and sellers have complete information about market conditions. The buyers have perfect knowledge about the conditions prevailing in the market for purchasing a commodity at the market price. If they do not have perfect knowledge, they may pay a higher price for the product. Then there would be different prices for the same product. So the buyers and sellers must have perfect knowledge to be able to buy goods and raw-materials at the prevailing market price.

15.4 Perfect Competition Versus Pure Competition

In perfect competition, perfect knowledge of market conditions is essential so as to have a single price for the product in the entire market. According to Chamberlin, pure competition means "competition unalloyed with monopoly element" whereas perfect competition involves "perfection in many other respects than the absence of monopoly" only. Nowhere in the real world, does perfect competition exist. Thus perfect competition is an ideal market form. Though perfect competition is an ideal condition, we have to study the characteristics of perfect competition to understand the working of an economy.

Check Your Progress -1

1. *What is perfect competition ?*

2. *List the charactristics of perfect competition .*

3. *What is pure competition ?What are its characteristics ?*

15.5 Conditions and Assumptions of Equilibrium of the Firm and Industry

15.5.1 Conditions of Equilibrium of the Firm

In perfect competition, an individual firm cannot influence price. A firm is said to be in equilibrium when it has no tendency to alter its production. The firm neither expands nor contracts its level of output. The firm earns maximum profits in equilibrium where marginal cost coincides with marginal revenue. We can show this diagrammatically. In perfect competition, the MR curve of a firm coincides with the AR curve. At the given price the demand curve is perfectly elastic. The firm

can sell as much as it wishes to sell so that the demand curve or AR curve is horizontal to the OX-axis. That is, the MR curve is horizontal to the OX-axis or MR = AR (price). Here the MC curve must cut the MR curve from below, and after the point of equilibrium it must be above the MR curve. The firm is in equilibrium when

Price = MC = MR = AR.

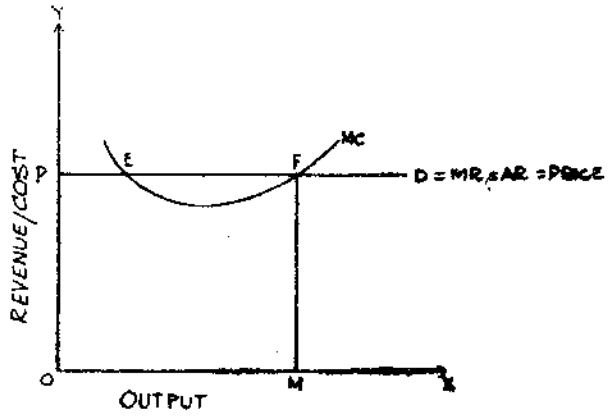


Fig - 15.2: Equilibrium of Firm under Perfect Competition

In the condition of equilibriun under perfect competition in Figure 15.2 above, the existing market price is OP. PD is both the average and marginal revenue curve. The marginal cost curve which is U-shaped is MC. The firm's output is measured on the OX-axis and the cost and revenue are measured on the OY-axis. In perfect competition the marginal cost curve is also its supply cuve. When there is an OP level of price in the market, the MC curve cuts the MR curve at point E from above where MC and MR are equal but it is not a point of maximum profits. If the firm increases its production beyond point E, the MC is below the MR curve, the cost per additional unit decreases and the firm earns large profits. As long as the MC curve is below the MR curve, it is desirable to increase production till it reaches the OM level of output at the point F where MC = MR. At point F, the MC curve cuts the MR curve from below. At this point the firm can maximze its profits. Suppose, the firm expands its production beyond the point F, the MC curve is above the MR curve, where the cost per additional unit is increasing and is greater than MR. Beyond the level of OM output, the firm incurs losses. So the firm is in equilibrium at OM level of output at point F where MC= MR. MR, Price and AR are equal under perfect. competition. Two conditions are to be fulfilled to achieve the equilibrium position of the firm. They are:

1) MC = MR

2) MC curve must cut MR curve from below.

The equilibrium level of output, however, does not guarantee maximum profits. The positive rofits of a firm depend on the relation between total revenue and total costs or average revenue and verage costs.

15.5.2 Assumptions

To explain the equilibrium of a firm in the short-run and the long-run the following assumptions are usually made :

1. Identical cost conditions : MC and AC cost conditions are the same for all firms in the industry.
2. The efficiency of entrepreneurs is the same for all firms.
3. Factors of production used by various firms are homogeneous.

Check Your Progress - 2

4. List the conditions for equilibrium of a firm.

15.6 Equilibrium in the Short - Run

The short-run is the period when the firm varies its production by changing variable factors, where the fixed capital remains unchanged.

Hitherto, we have explained equilibrium conditions to be fulfilled by a firm to achieve the equilibrium condition. But we cannot understand a firm's absolute profit or loss position. To understand profit or loss position, we must consider three possibilities.

a) When a firm earns abnormal profits

b) When a firm earns normal profits

c) When a firm incurs losses

15.6.1 When A Firm Earns Abnormal Profits

In the Figure 5.3, if price is OP, PL is the average revenue and marginal revenue curve in perfect competition. SMC is the short-run marginal cost curve and SAC is the short-run average cost curve. They are generally U-shaped curves. The firm is in equilibrium at output OM_2 where the MC curve cuts the MR curve from below at R,i.e, MC = MR =AR. At output OM_2 the average cost is M_2T and the average revenue or price is OP or M_2R. Here the price or AR is greater than the average cost. The firm is earning M_2R-M_2T = RT profits per unit.

Total Revenue = AR × Output

= OP × OM_2 = [ ] $OPRM_2$

Total Cost = AC × Output

= OC × OM_2 = [ ] $OCTM_2$

Abnormal Profits = TR - TC = [ ] $OPRM_2$ - [ ] $OCTM_2$

= [ ] CPRT.

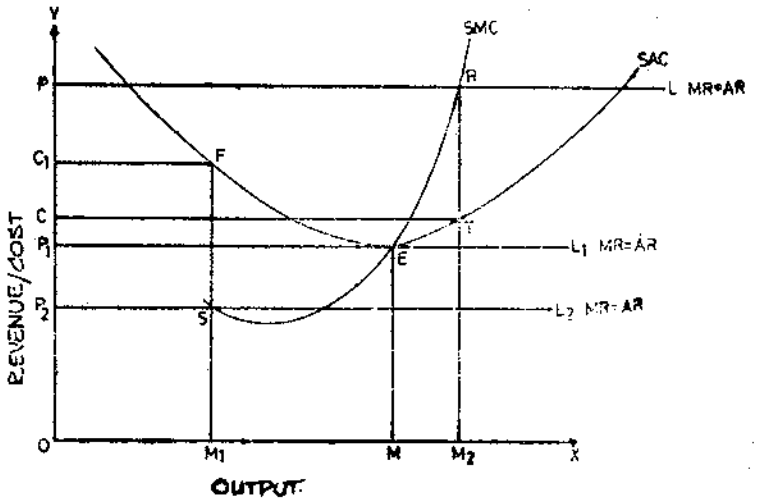


Fig - 15.3: Equilibrium of the Firm in the Short-run

The firm is earning more than the normal profits. The arc CPRT shows abnormal profits. There are number of firms in the industry earning abnormal profits. In perfect competition, when firms with identical cost conditions are earning supernormal profits in the industry, new firms enter the industry so as to compete and draw away the abnormal profits. But in the short-run, it is not sufficient for new firms to enter the industry . So the existing firms continue to earn supernormal profits. Though the firms are in equilibrium, the industry will not be in equilibrium as there is a chance for new firms to enter the industry.

15.6.2 When A Firm Earning Normal Profits

Supose the market price is OP_1, P_1L_1 the average revenue and marginal revenue curve. The SMC curve cuts the P_1L_1 marginal revenue curve at point E from below where the firm at output OM is in equilibrium. The minimum SAC is a tangent to the average revenue curve at point E, where, AR = AC and MR = MC = AR = AC. At output OM, the firm earns the total revenue of the area OP_1 EM. Here total cost is equal to total revenue. That means the firm earns only normal profits. All the firms with identical cost conditions earn only normal profits, where there is no tendency to leave or enter the industry. Here the firm as well as industry will be in equilibrium in the short-run This type of equilibrium occurs by accident only. Therefore the firm neither gains abnormal profits nor incurs losses.

15.6.3 When a Firm Incurring Losses

In the short-run, if the prevailing market price is OP_2, P_2L_2 is both the average and the marginal revenue curve. The SMC curve cuts P_2L_2 marginal revenue curve at point S at OM_1 level of output, where the firm is in equilibrium. Though the firm is in equilibrium, in incurs losses, the cost per unit being greater than price. Average cost is M_1F or OC_1 and the average revenue is OP_2 or M_1S. The firm is incurring loss. $M_1S - M_1F = FS$ per unit.

Total Cost = AC × Output

= $OC_1 \times OM_1$ = $\square$ OC_1FM_1

Total Revenue = AR × Output

= $OP_2 \times OM_1$ = $\square$ OP_2SM_1

Total Loss = Total Revenue - Total Cost

$= \square OP_2 SM_1 - \square OC_1 FM_1$

$= \square P_2 C_1 FS.$

The firm is incurring losses in the short-run. All the firms with identical cost curves are also incurring minimum losses. There is a tendency for the firms to leave the industry. Even though, they incur losses, the firms do not do so because, in the short-run, the industry is not in equilibrium and there is a tendency for firms to quit the industry. In the short run firms change production by varying the variable capital. If the price is more than the average variable cost, the firm covers the full variable costs and a part of the fixed costs, so that they remain in the industry instead of leaving the industry. If losses are greater than the variable costs and the fixed costs, then the firm will close down so as to avoid unnecessary losses.

15.7 Equilibrium in the Long-Run

Long-run is a period which is long enough to change the level of output by altering the variable capital as well as the fixed capital. Unlike short-run in the long-run, all factors are variable, nothing remains fixed. If production is to be increased, or decreased, the plant size will be increased or decreased according to the demand conditions in the market. In the long-run, to meet the demand situation, the plant size or fixed capital or plant capacity is changed, but this is not the situation in the short-run. In the long-run, the long-run average cost and marginal cost curves are relevant in determining the equilibrium level of output. In the short-run, a firm has to be in equilibrium when MC is equal to MR. This holds valid even in the long-run period. In the long-run, when MC is equal to MR and the price is equal to the average cost, the firms in the industry earn abnormal profits. Encouraged by abnormal profits new firms enter the industry, with the result that production is increased. Competition for the extra profits compels firms to keep the price down to the average cost. If the price is below the average cost, the firm in the industry incurs losses. To avoid heavy losses some firms leave the industry. This decreases the production and forces the price to stay at the average cost, so tha the firms remaining in industry make normal profits.

In the long-run , a firm is said to be in equilibrium if two conditions are fulfilled :

1. Price (AR) = MC = MR
2. Price (AR) = MC = AC

Hence, in perfect competition in the long -run the firm will be in equilibrium if Price = AR = MR = AC.

In the long-run, while LAC is falling, LMC is below it; while LAC is rising, the LMC is above it; if LAC is neither rising nor falling, the LMC intersects it at its minimum, where LMC = minimum LAC = MR = Price (P). That is, when a firm is said to be in equilibrium, earning normal profits, the LMC intersects the LAC at its minimum which is equal to price.

Price = Marginal Cost = Minimum AC. We can understand this with the help of a diagram.

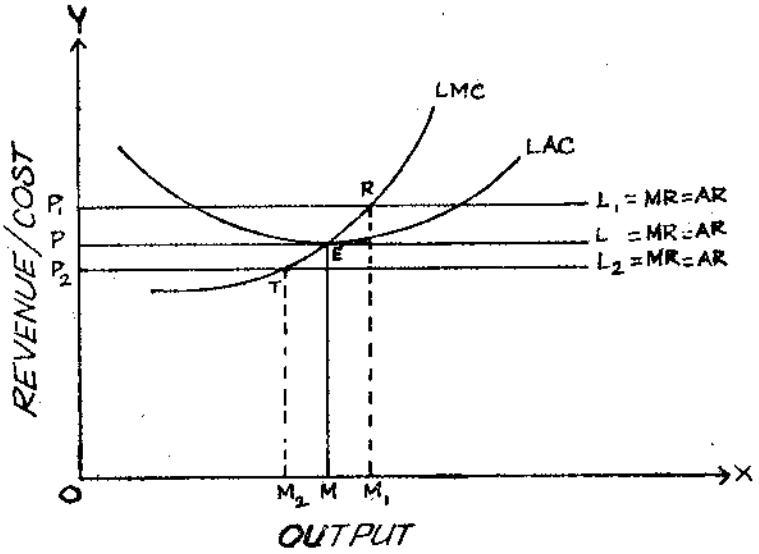


Fig - 15.4 : Equilibrium of Firm and Industry in the long-run in Perfect Competition

In Figure 15.4 above, LAC is the long-run average cost curve and LMC is the long-run marginal cost curve. If the market price is OP_1, P_1L_1 is the average and marginal revenue curve in the perfect competition. At price OP_1, the firm is in equilibrium at point R at output OM_1. All the firms with identical cost curves earn abnormal profits, with the result that new firms enter the industry and increase production. The increase in production presses down the price to OP level and equates it to the average cost at its minimum, where the firm and industry will be in equilibrium.

If the price is OP_2, which is below AC, the firm will be in equilibrium at point T where MC = OP_2 which is less than AC. All the firms with identical cost curves will incur losses. In consequence, to avoid losses the firm in perfect competition will leave the industry in the long-run. This reduces the level of output in the market raising the price from OP_2 to OP to equal average cost, where the firm will be making normal profits. In such a situation a firm will not leave or enter industry. The firm and industry are said to be inequilibrium in the long-run. Therefore, the firm and industry get only normal profits in the long-run. LMC cuts LAC at its minimum point, E, where Price = AR = MR = AC = MR .In the Fig. 15.4 OP is the long-run price and OM is the long-run equilibrium quantity and the firm and industry will be in equilibrium at point E.

15.8 Optimum Firm

An entrepreneur produces commodities with the given scale of the plant. As he increases production, the cost per unit decreases. He continues to increase the level of output till he gets economies of scale. After a stage, he however stops the production of the commodity, when the firm reaches its minimum, cost of production. The average cost is the lowest at this point. If he still expands his level output, diseconomies will set- in. The point where the average cost of the firm is lowest is considered as the optimum level of output for the firm concerned. This is the optimin size of the firm with minimum averge cost.

We can explain this with the help of Figure 15.5.

We measure units of output on the OX-axis and cost of production on the OY-axis. LAC is the long-run average cost curve. It indicates average cost of production at different levels of production in the long-run. SAC_1, SAC_2 etc. are the short-run average cost curves of different scales of firms.

SAC_4 represents the short-run average cost curve, which produces OM level of output with the minimum average cost at point T.

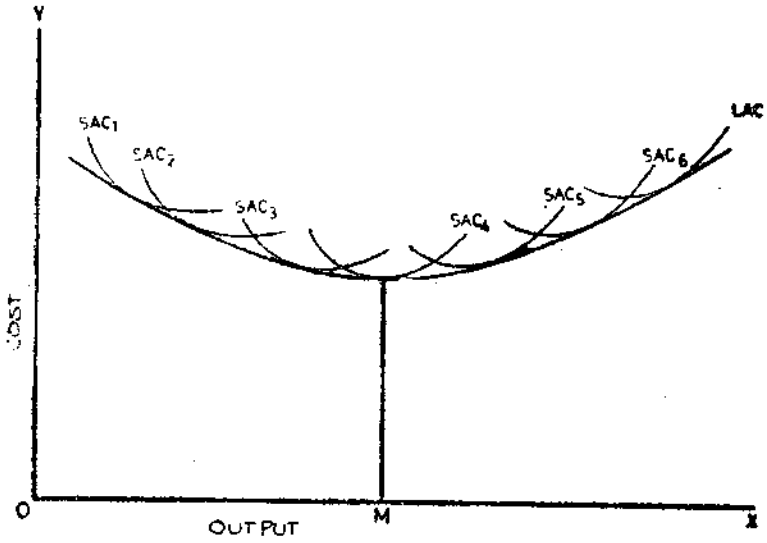


Fig - 15.5 : Optimum Firm

TM is the minimum average cost at this level of output. At this level of output (OM), the cost per unit is the lowest with the plant of SAC_4 compared to that of the other plants. Suppose, the entrepreneur increases the size of the plant beyond SAC_4, various diseconomies of scale will result and the average cost of production will increase. Similarly a new decreases the size of the plant, which is smaller than SAC_4, the average cost of production will also be high. This is because the scale of the plant is smaller and the producer will not be able to avail all the economies of scale. Thus SAC_4 is the position where the firm will be functioning at the optimum. OM is the optimum level of output with the leat-cost output of the firm. *The firm which produces the optimum level of output with the optimum plant is known as an optimum firm.*

Check Your Progress -3

5. *What is the optimum size of a firm ?*

15.9 Summing Up

In this unit, we have discussed the characteristics of perfect competition. In the perfect competition, a large number of producers and consumers deal with a homogeneous product where firms have the choice of free entry and free exit. Equilibrium of a firm in perfect and imperfect competitions depends on two conditions, namely MC = MR and MC curve must cut MR curve from below. In perfect competition, the firm will be in equlibrium when it gets abnormal profits or normal profits or even losses in the short run. But, in the long run, the firm will always get normal profits. The reason is that, when an industry gets abnormal profits, other firms will enter this industry. In the same way if industry gets losses, a few firms leave the industry in the long run. So in the long run firms will be in equilibrium when they get only normal profits.

Here, one should not forget that industry is a group of firms producing an identical or similar commodity. Optimum firm indicates optimum size of output where a firm incurs minimum average cost.

- Sri P. Rajesham

15.10 Suggested Books

1. Richard A. Bilas : Micro Economic Theory - A Graphical analysis.
2. Stonier and Hague : A Text Book of Economic Theory.
3. A. Koutsoyiannis : Modern Micro Economics.

15.11 Model Examination Questions

I Answer each of the folllowing questions in about 30 lines.

1. Examine the characteristics of perfect competition.
2. Explain the equilibrium of the firm and industry in the short-run under perfect competition.
3. Discuss briefly the concept of the optimum firm with the help of a diagram.
4. Discuss the determination of equilibrium price under perfect competition in the short-run.
5. Explain the equilibrium of a firm in the long run under perfect competition (diagrammatically).

II Answer each of the following questions in about 15 lines.

1 Explain the conditions of equilibrium under perfect competition.
2. Explain the difference between pure competition and perfect competition.
3. What is optimum firm ?

Unit - 16 : Monopoly and Imperfect Competition

Contents

16.0 Aims and Objectives

This unit explains the major three forms of imperfect competition, viz., monopoly, monopolistic competition and oligopoly. It discusses monopoly in great detail, such as, kinds of monopoly, price and output determination under simple monopoly and discriminating monopoly.

After reading the unit, you will be able to

* define monopoly, monopolistic competition and oligopoly,
* classify the monopoly into different kinds,
* determine the price under simple monopoly,
* differentiate monopoly from perfect competition,

* explain the discriminating monopoly,
* examine the distribution of given output under discriminating monopoly;
* analyse the determination of price under discriminating monopoly, and
* describe the characteristics of monopolistic competition and oligopoly .

16.1 Introduction

We have discussed how price and output are determined in perfect competition. Now in this unit we shall see how price and output are determined in imperfect competition. There are two limiting types of market situations. One is pure competition which was already discussed in the previous unit, the other is pure monopoly . In the actual world, we do not find either perfect competition or pure monopoly, but we find a region of 'imperfect' competition lying between those limits.

16.2 Meaning of Monopoly

In monopoly, a product has only one producer. There are no close substitutes for the product. There is low cross-elasticity of demand with every other product. The price and output of the monopolised product cannot perceptibly be affected by the other products. In other words, the monopolist cannot have control over the price and output policies of other firms. As there is only one firm producing a product in the industry, it is simultaneously a firm and an industry. The demand curve of a monopoly firm slopes stably downward to the right. The producer is a price setter and the price set by him yields him maximum profits. But this does not mean that he can decide both the price and the output. He can decide only one of the two things. The producer either chooses for himself the level of output or he determines the price of the product depending on the conditions of demand in the market. Once he fixes the price for his product, he leaves the level of output to be determined by the demand for the product at that price in the market. In any event, the sole goal of the monopolist is to earn maximum profits.

The type of monopoly which was discussed above is called the ***simple or imperfect monopoly.*** We shall briefly describe pure monopoly also, though our main concern is with simple monopoly and discriminating monopoly.

In pure monopoly, there is only one producer. Competition even in this limited firm is absolutely absent. This means that the producer has no rivals, no substitutes. Neither does the monopolist influence the price-output policies of other firms nor are the price-output policies of his firm influenced by other firms. In the words of Triffin, "Pure monopoly is that where cross-elasticity of demand of the monopolist's product is zero". According to Stonier & Hague," it (pure monopoly) would occur when the average revenue curve of the firm was a rectangular hyperbola with an elasticity of demand equal to one, and when the monopolist took the whole community's income all the time".

Pure monopoly never occurs in the real world. This limiting case is merely a theoretical one.

16.3 Kinds of Monopoly

We shall now discuss the different kinds of monopoly

16.3.1 Natural Monopoly

There are certain commodities which are available in a small or single place. Their supply is

localised. Such localisation of any commodity in a single place is called natural monopoly. Diamonds are extracted in South Africa. The extraction of diamonds is controlled by South Africa. India possesses manganese mines. They are examples of natural monopolies.

16.3.2 Legal Monopoly

Any legal right which is sanctioned to a firm to produce a unique commodity is known as legal monopoly. For example, if the right of manufacturing a medicine with the brand name has been given by law to a company, no other company can produce the medicine using the same brand name. This type of monopoly is what we find in the case of products produced by multi-nationals like petroleum companies, pharmaceuticals, etc.

16.3.3 Public Monopoly

There are some utility services which are meant for the welfare of the public. Such services are only controlled and provided by public agencies and are called public utilities. Municipalities providing the water supply, electricity, telephones, etc., are public monopolies.

16.3.4 Artificial Monopoly

Individual producers and firms create artificial monopolies for the purpose of maximising profits. The individual producers of the same product come together and form into a single organisation so as to liquidate competition among themselves and to maximise profits. Such types of amalgamation of individual firms into a single organisation is known as artificial monopoly or private monopoly.

Check Your Progress - 1

1. *What is monopoly /simple monopoly/ imperfect monopoly?*
2. *What is pure monopoly?*
3. *What is natural monopoly?*

16.4 Price Determination under Simple Monopoly

16.4.1 Assumptions

We study here the determination of price, output and profit under monopoly. The determination of price is based on the following assumptions:

1. Simple monopoly
2. Very low cross-elasticity of demand with other goods
3. Rational monopolist
4. Aim of maximum profits
5. Full competition in terms of demand
6. No price discrimination
7. Uncontrolled power of monopolist

16.4.2 Price and Output under Monopoly

Given these assumptions, the forces of demand and supply determine the price, output and profit under monopoly. The supply of the product is completely governed by the monopolist. The price is fixed by the monopolist to yield him the maximum profit. But both the price and the level of output cannot simultaneously be controlled by him. He can either decide the level of output, and leave the price of the output to be determined by consumer demand, or he can fix the price and leave the level of output to be decided by the demand for the product at that price. Thus the conditions of demand decide the price fixation and the level of output to be produced by the monopolist.

Under monopoly conditions, the demand curve or average revenue curve or sales curve slopes downward to the right. The average revenue curve will indicate that the monopolist can sell more only by reducing its price. The AR curve has its corresponding MR curve, which lies below it. If the AR curve is a negatively sloping straight line, the MR curve will also be a straight line sloping negatively.

The monopolist influences price or output depending on the elasticity of demand for his product. If the elasticity of demand is high for his product, he reduces the price and sells a greater quantity earning maximum profits. If the elasticity of demand for his product is inelastic, he raises the price and by selling less still gains the maximum profits.

The monopolist can produce the most profitable output against the demand for his product. This will depend on the conditions of supply. The cost of production may rise, fall or remain constant

If the cost of production rises, every increase in output will lead to an increase in cost per unit, and the monopolist can produce less and fix a higher price. If the cost of production decreases, every increase in output will lead to a decrease in cost per unit, and he will be able to fix a lower price. If the cost of production remains constant, there will be no change in cost per unit with every increase in output, but the price will be fixed according to the demand for the product. Whatever the cost of production may be, the monopolist continues to produce the commodities as long as the total revenue is greater than the total costs. In other words, he continues to produce so long as additional units add more to revenue than to cost. That is likely to happen irrespective of whether the marginal cost (MC) curve cuts the MR curve while it is falling, rising or perpendicular to the MR curve under monopoly conditions. In perfect competition however, the firm will be in equilibrium when the MC curve cuts the MR curve from below.

We shall now dicuss the price-output equilibrium of the monopolist.

16.4.3 Price And Output Equilibrium Under Monopoly

The sole aim of the monopolist is to maximise profits. He goes on producing goods till MR equals MC, where the firm will be in equilibrium. At this level of price-output, the profits are maximum. The following figure reveals the price-output equilibrium of the monopolist.

AR is the average revenue curve, MR is the marginal revenue curve. AC is the average cost curve and MC the marginal cost curve. The monopolist continues his production upto OM level where MR equals MC at point E. Thus the firm is in equilibrium at E. As the production is increased beyond the OM level when profits are maximised, the marginal revenue is less than the marginal cost. The firm will not be in equilibrium as it will earn less than maximum profits.

If we look at the average revenue curve or demnand curve AR, we find that the OM output is sold in the market at price OP. In Figure-16.1, the price or demand or average revenue is MF (=OP) corresponding to the equilibrium output. Under the cost-revenue situation, where MC = MR at point E in Figure-16.1, the firm will be in equilibrium at output OM. The monopolist fixes a price equal to MF (=OP). MF or OP is the average revenue and MG or OS is the average cost at the equilibrium output OM. PS or FG is the profit per unit.

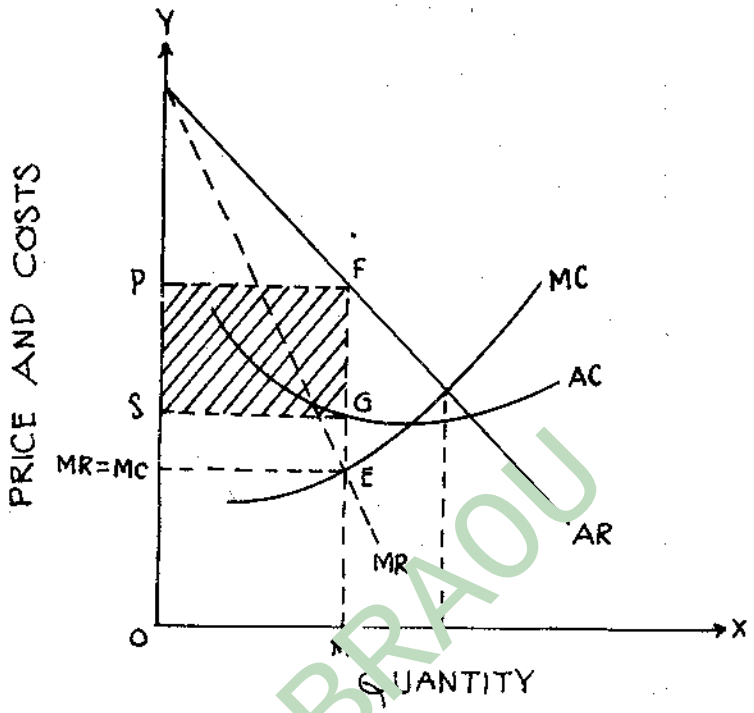


Fig. 16.1 : Price Output Equilibrium Under Monopoly

Now Total Revenue = AR X Output sold

= OP X OM = □ OPFM

Total Cost = AC X Output produced

= OS X OM = □ OSGM

Therefore, Profits = TR - TC

= □ OPFM - □ OSGM

= □ SPFG (the shaded area)

or

Monopolist's Profits = Profits per unit X Total OutPut sold

= PS X OM

= PS X SG = □ SPFG

The monopolist earns total profits equal to the shaded area rectangle SPFG, when the firm is in equilibrium at E in Figure-16.1. Thus the equilibrium price-output and profits are determined uner monopoly. Under monopoly conditions, when there is no competition, the total revenue earned by the monopolist is greater than the total costs. Normal profits for the services of entrepreneurial capacities are included in the total costs. When TR exceeds TC, the monopolist earns more than normal profits and the extent of the excess profits earned by the monopolist may be called the *degree of exploitation*. We need to study the causes for this exploitation and consider who (among the four factors of production employed in the process of production) gets exploited in this situtation.

The exploitation may arise from the price which is fixed at a higher level than the cost incurred per unit or AC in which normal profits are included. It may be difficult to say exactly who is exploited unless the services rendered by different factors of production are calculated at the prevailing prices for them. Or the monopolist may have exploited the constomers by extracting more money from the pockets than he should have. In imperfect competition, the exploitation is bound to occur in some form or the other. Exploitation is inherent in imperfect competition. Exploitation is inherent in perfect competition also as it was pointed out by Marx, but normnal profits are treated in economic literature as just profits , which, under monopoly or imperfect competition, are treated as the firm's abnormal profits.

Check Your Progress - 2

4. *Can a monopolist decide both level of output and the price of the output?*

5. *Explain, graphically, the shapes of AR and MR curves.*

6. *What is degree of exploitation? How does it arise?*

16.5 Comparison between Perfect Competition and Monopoly

When perfect competition is compared with monopoly, it may be considered superior to the latter because of some merits that it has. Perfect competition and monopoly have some apparent similarities. The aim of both the markets is to maximise profit. Firms in both the markets reach equilibrium situation when MR = MC. But there are also fundamental dissimilarities between the two.

a) In perfect competition, there are a number of buyers and sellers. There is a distinction between a firm and an industry. There is free competition among the producers. The forces of demand and supply determine the price for the entire industry. All firms sell their product at the ruling price. No firm can change the price by individual actions. Every firm adjusts its output to that price. There is only one price for the same product throughout the market. On, the other hand, the firm and industry are one and the same under monopoly. The producer is a price-setter. There is only a single firm and there is no competition.

b) In perfect competition, the AR curve or demand curve of a firm is a horizontal straight line parellel to the OX-axis. It is perfectly elastic. The marginal revenue curve coincides with it. Under monopoly, the AR curve of a firm slopes downward to the right and the MR curve lies below it.

c) Under perfect competition and monopoly, the firms reach the equilibrium stage under the same conditions, i.e., MC = MR. But there is a difference between price and marginal cost relation-

ship. Under perfect competition when a firm is in equilibrium, MC = MR and MR = AR because MR coincides with AR. Then the marginal cost is equal to MR and AR as they are horizontal straight lines parallel to the OX-axis. Under monopoly, AR slopes downward to the right, and MR also slopes down and lies below it. That is why, the MR does not coincide with AR. When a firm is in equilibrium MC = MR, but MC is not equal to price, AR, but MC = MR < Price = (AR).

d) Under perfect competition the firm is in the equilibrium position when the marginal cost curve cuts the MR curve, the horizontal straight line, is that parallel to the OX-axis, from below, and the MC curve rises upwards from left to right. On the other hand, under monopoly, the firm is in equilibrium, when the MC curve cuts the MR curve from below not only when the MC curve rises, or falls but when it is constant because of MR sloping downward to the right.

e) In perect competition, the firm in the long-run will earn only normal profits, but in the short-run it can earn more than normal profits or losses. On the contrary, under monopoly, as there is only one firm in the industry even if the firm incurs losses in the short-run, it will earn abnormnal profits in the long-run, as there is no chance for new firms to enter the industry.

f) Some other important differences between perfect competition and monopoly are explained with the help of the figure given below:

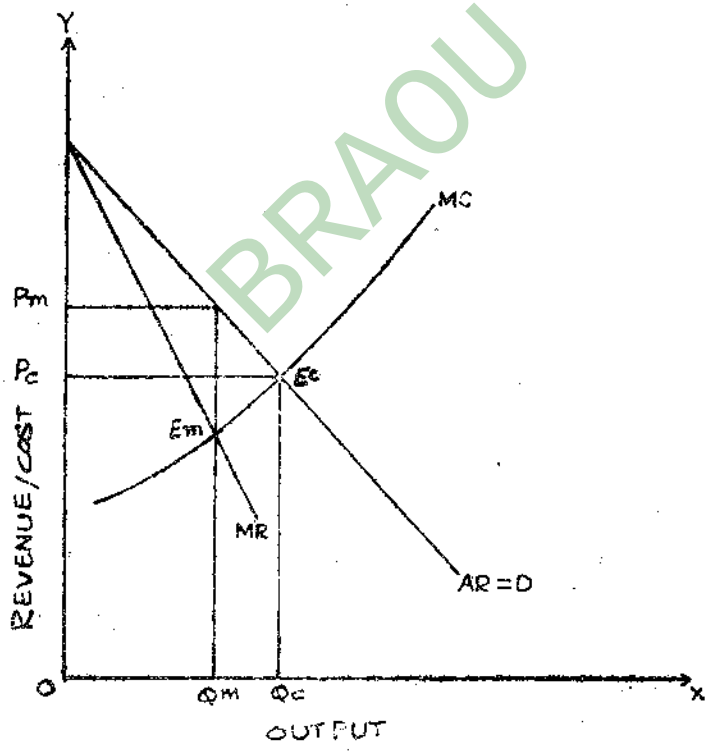


Fig. - 16.2 : Output Difference between Perfect Competition and Monopoly

Em = Monopoly Equilibrium (MR = MC)

Ec = Equilibrium in Perfect Competition (MR = AR = MC)

If we look at Figure 16.2 we notice that under perfect competition, the firm reaches equilibrium at point Ec when MR coincides with AR at the point where MC = MR = AR. The quantity produced is OQc and the price is OPc. Under monopoly, the firm reaches equilibrium at Em where

MC = MR<AR. The quantity produced is OQm and the price is OPm. Let us compare output and price under both markets. Take monopoly output. It is OQm which is less than the output produced under perfect competition OQc and the price charged under monopoly is OPm which is more than the price charged under perfect competition OPc. This shows that under perfect competition, more goods are available at a lower price whereas under monopoly, fewer goods are available at a higher price. Consumers thus forego surplus under monopoly. That is why, in recent times there has been a growing demand that public utilities which are under the control of public authorities like Provincial Governments should adopt marginal cost pricing which will be beneficial to the consumer.

Check Your Progress - 3

7. *List the main differences between perfect competition and monopoly?*

16.6 Monopoly Price Discrimunation

Price discrimination means changing different prices from different consumers for different units of the same product or service. According to Joan Robinson, "The act of selling one article, produced under single control at different prices to different buyers is known as price discrimination". Price discrimination will not occur under perfect competition. It only occurs in monopoly or in imperfect competition. The monopolist governs the supply of the product that is why he charges different prices from different buyers or in the different markets. The theory is an extension of monopoly pricing.

16.7 Forms of Price Discrimination

i) Personal Discrimination: This is based on the incomes of the consumers. Doctors and lawyers charge higher fees to rich persons and lower fees to poor people for the same service.

ii) Nature of Product : Price discrimination depends on the nature of the production. Suppose there are two types of editions of the same book, one is a paper back edition and the other is a deluxe edition. The former is cheaper than the latter.

iii) Local Discrimination: This is based on the locality in which the product is sold. The monopolist changes a high price in the domestic market for the product whereas he charges a lower price in the international market for the same product.

iv) Trade Distribution : This may also be called use discrimination. For example the State Electricity Board charges low rates for agricultural purposes, but it charges high rates for industrial use.

16.8 Conditions for Price Discrimination

Here we discuss important conditions for price discrimination. Price discrimination is possible under imperfect competition or monopoly. If a monopolist is in a position to get profit by charging different prices for different units of the same product, he will formulate a policy of price discrimination. Price discrimination is practicable under the following conditions.

16.8.1 Separate Markets

There must be two separate markets. The buyer of one market should not move to the other market. The monopolist will then be able to change a high price for a product in one market and a low price in other market for the same product.

16.8.2 Different Elasticities of Demand

There must be different elasticities of demand for the same product. If the product possesses less elasticity of demand in one market, then it should have more elasticity of demand in the other market. The monopolist sets the profit by selling his products at different prices in different markets which have different elasticities of demand for the same product.

Here we shall discuss the most common type of price discrimination. The monopolist classifies the buyers into two categories. He charges different prices from different markets. The monopolist produces certain amounts of commodities, which are sold in two separate markets. The cost of production is ignored here. This output is adjusted in each market such that the marginal revenue derived from the first market equals the marginal revenue derived from the second market. Prices are different due to differences in elasticities of demand in the two markets, but marginal services are not different.

Check Your Progress - 4

8. What is monopoly price discrimination?

9. List the important conditions for price discrimination?

16.9 Distribution of Given Output Under Discrimination Monopoly

We suppose that there are two distinct markets. We assume that the monopolist produces some amount of output and wants to distribute the given output in the most profitable way between the two markets. Here the monopolist has discriminated the price for the product in the two different markets. Under the conditions, it is necessary that the elasticities of demand must be different in the two different markets. We assume that market-I is less elastic and market-II is more elastic. The marginal revenues in the markets will also be different. Here we ignore costs of production. The monopolist should distribute his given output among the two markets. This distribution should be made in such a way that the marginal revenue in one market is equal to the marginal revenue in the other. Then only he can maximise his profit. If the marginal revenue of market-I is greater than the marginal revenue of market-II, the monopolist sells the additional units in market-I. He will continue this until the marginal revenues in each market are made equal. If he continues the switching process still further, he losses because the marginal revenue in market-I will eventually become less than the marginal revenue in the market-II. Since the elasticities of demand are different in the two markets, the monopolist will gain maximum profits from the given output when the marginal revenues are equal in both the markets. This can be explained with the help of a diagram as shown in figure 16.3.

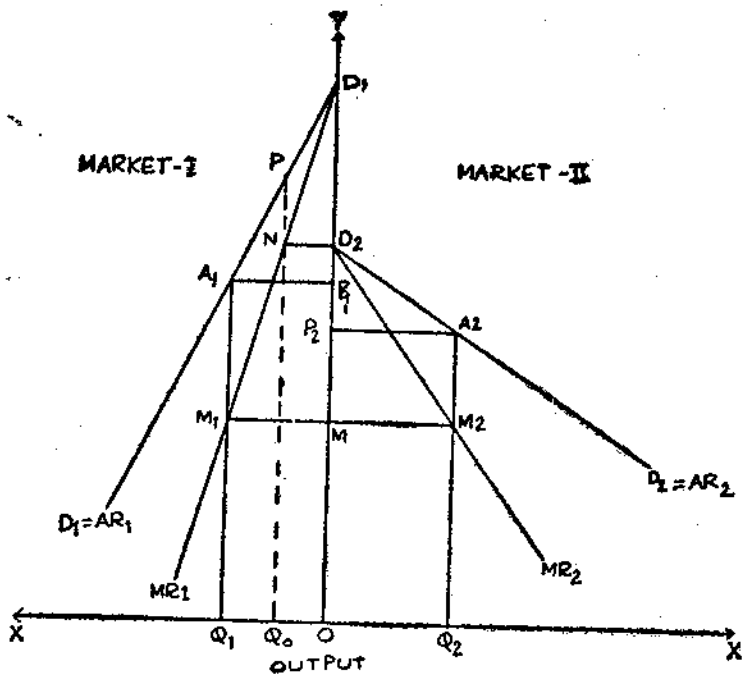


Fig. - 16.3 : Distribution of Given Output in The Two Markets

AR_1 and AR_2 are the average revenue or demand curves of the two markets I and II respectively. MR_1 and MR_2 are corresponding marginal revenue curves. Now, if the given output is below OQ_1 the monopolist should sell the entire quantity in market I because upto this level of output the marginal revenue of market I is greater than the marginal revenue of market II. If his total output is equal to Q_1Q_2 ($OQ_1 + OQ_2$) he should sell OQ_1 output in market I and OQ_2 in market II, so that marginal revenue in market I equals marginal revenue in market II. The level of marginal revenue in both the markets wil be equal to $OM = Q_1M_1 = Q_2M_2 = MR_1 = MR_2$.

MR_1 = Marginal Revenue of Market I.

MR_2 = Marginal Revenue of Market II.

This is the situation in which the monopolist is in equilibrium, and at this point, he maximises total profits from the given output. This distribution of output reveals that the price in market I will be OP_1 and the price in market II will be OP_2. It is evident that the price in market I is higher than the price in market II. But the output in market II is more than the output in market I. In other words it is obvious that marginal revenue in both the markets are same but the prices are different. In market I, the elasticity of demand is less. As a result, the price will be higher. In market II, the elasticity of demand curve is more and the price will be lower. We can prove this by the following mathematical formula.

$$MR = P\left(\frac{1}{\eta}\right)$$

Where MR = Marginal Revenue,

P = Price, and

η = Elasticity of demand.

Since in equilibium

$$MR_1 = MR_2,$$

Where $Mr_1 = P_1 \left(1 - \frac{1}{\eta_1}\right)$

$$MR_2 = P_2 \left(1 - \frac{1}{\eta_2}\right)$$

η_1 = elasticity of demand in market I

η_2 = elasticity of demand in market II

Therefore, when elasticities in the two markets are not same, the prices in the markets will differ. Then there is price discrimination. The price in market I is P_1 which differs from the price P_2 in market II. Here we find that the price in market I is greater than the price in market II. The monopolist practices price discrimination in different markets. If elasticities of demand are equal in both the markets, price will also be the same in the two markets. In such a situation we would not find price discrimination.

Let us assume $\eta_1 = 3$ and $\eta_2 = 6$. Applying these values in the above equations, we get

$$P_1\left(1 - \frac{1}{3}\right) = P_2 \left(1 - \frac{1}{6}\right)$$

$$\text{or, } \frac{2}{3}P_1 = \frac{5}{6}P_2$$

$$\text{or } P_1 = \frac{5}{6} \times \frac{3}{2} P_2 = \frac{5}{4} P_2$$

Thus, $P_1 > P_2$ if $\eta_1 < \eta_2$, similarly if $\eta_1 = \eta_2$ then $p_1 = p_2$. Therefore, price discrimination is present only when elasticities of demand in the two markets are different.

Check Your Progress - 5

10. *What is the formula of marginal revenue in terms of price and elasticity of demand?*

16.10 Price and Output under Discriminating Monopoly

We have dealt with the distribution of output in two different markets. To maximise profit, the monopolist charges different prices in different markets. Price discrimination, the monopolist's method of maximisation of profits, is explained above ignoring the costs of production. Here, we shall explain price discrimination and profit maximisation taking into account the costs of production. The aim of a monopolist is to maximise his total profits. For this, he has to consider costs of production and revenues. We assume, as we have done earlier, that there are two markets. The monopolist earns maximum profits when marginal revenues in the two markets are equal. And at the same time the marginal revenues are also equal to the marginal costs of the monopolist's total production.

This can be explained with the help of the figure 16.4(a,b,c).

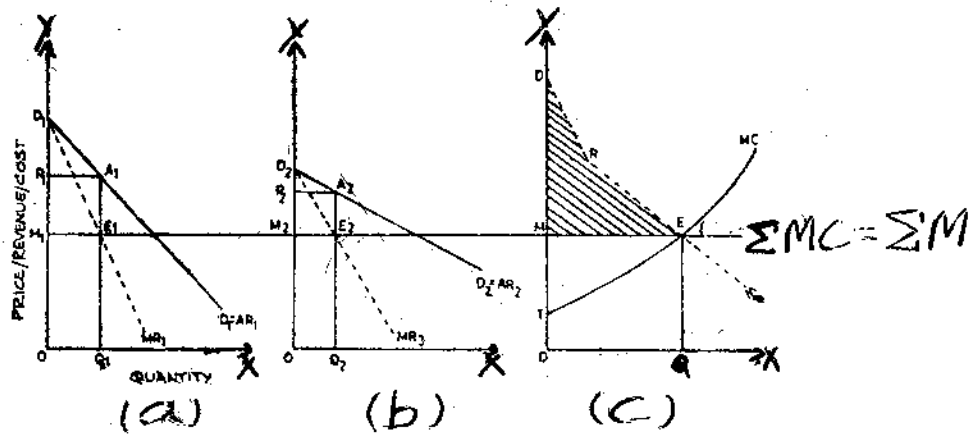


Fig. - 16.4 (a, b, c,) : Determination of Price and Output

Suppose, in figure-16.4, there are two markets, I & II, and AR_1 and AR_2 respectively are the average revenue curves for them. MR_1 and MR_2 are the corresponding marginal revenue curves respectively. These two markets have different elasticities of demand at each price. Now the monopolist must determine his total output regardless of how it is distributed. For this the monopolist follows the profit maximisation rule where MC = MR. We have shown in Figure-16.4 (c) that total (combined) marginal revenue (Σ MR) and the marginal cost curve (MC) for the total output. The total marginal revenue for the total output is the horizontal addition of the two separate marginal revenues MR_1 and MR_2 of the individual markets. Now the monopolist will be in equilibrium at point E where MC = Σ MR. OQ is the equilibrium level of output. The monopolist faces the problem of distributing the OQ output between the two markets, I and II. For this, he has to follow the rule $MR_1 = MR_2 = MC = \Sigma MR$. Following this rule OQ_1 output should be sold in market I and OQ_2 output in market II. As the monopolist distributes his total output between the two markets, the marginal revenue OM_1 in market I is equal to the marginal revenue OM_2 in market II. E_1 and E_2 are equilibrium points of market I and II respectively. The price in market I is OP_1, and the price in market II is OP_2. The monopolist earns total maximum profits which are equal to the shaded area DREM shown in Figure-16.4 (c).

16.11 Monopolistic Competition

16.11.1 Meaning

Monopolistic competition is that where there are large number of producers of a differentiated product in the market. According to A.W.Stonier and D.C.Hague, "There is competition which is keen, though not perfect, between many firms, making very similar products". In monopplistic competition, the price-output policies will not be influenced by others. There is competition among large number of producers who produce close but not perfect substitute goods. Monopolistic competition is some times known as *group equilibrium*.

16.11.2 Characteristics of Monopolistic Competition

The main characteristics of monopplistic competition are explained here.

i) Relatively small number of firms: In monopolistic competition sellers are les than that under prefect competition. For this reason, the producers enjoy some monopoly power. Price-output decisions of individual sellers will not influence other actions. There is an independent course of action. The producers produce differentiated products and charge different prices for their products.

ii) Product differentiation : In monopolistic competition product differentiation is an important feature. According to prof. Chamberlin, there are many firms which produce a particular product, but the product of each firm is in some way different from that of the other firm. Product differentiation may be in the form of trade marks, patent rights, brand names, etc. Product differentiation means that the products are different in some way from each other. They are heterogeneous. There is slight difference between one product and other in the same categorv. Products are close substitutes with high cross elasticity but not perfect substitutes. For example, toothpastes are produced by different companies under different brand names like Colgate, Close-up, Cibaca, Forhans, etc.

iii) Freedom of entry of new firm: Under Monopolistic competition, there is monopoly power to individual firms for its product. The individual form faces keen competition from other firms which are producing similar products. So the individual firm cannot restrict the entry of new firms. Each firm in a way behaves like a monopolist but if faces competition from others as it also sells almost a similiar product. That is why it has been a blend of monopoly and competition and named as Monopolistic competition.

iv) Competitive advertisement: The practice of competitive advertising is the important characteristic of monopolistic competition. Advertisement creates some difference between two brands say X and Y in the minds of the consumer though they may be almost identical in their technical or chemical composition. The effective and efficient advertisement creates difference of images of the same product in the minds of consumers due to which the products look different from the point of view of consumers. Thus advertisement technique is very important feature of monopolistic competition. For example every soap producer advertises in all types of media like newspapers, radio and television.

v) Downward sloping demand curve : The shape of demand curve is based on the product differentiation under monopolistic competition. There is some monopoly power for the firm as there is product differentiation. Due to the product differentiation, close substitutes are available. Thus the firm will have more elastic demand curve for its product. The demand curve under monopolistic competition will be less steep as compared to that of monopoly firm. This means a slight fall in price will lead to a large increase in the demand for its product provided the prices of other firms remain the same. The demand curve slopes downward to the right.

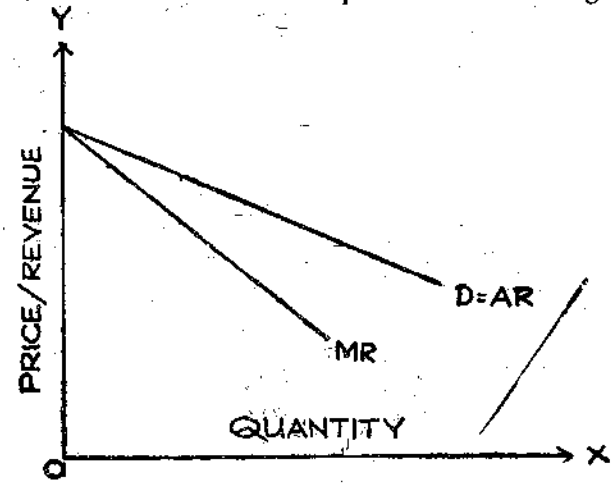


Fig. - 16.5 : Shape of Demand Curve in Monopolistic Competition

16.12 Oligopoly

16.12.1 Meaning and Definition of Oligopoly

The term "oligopoly" is derived from two Greek words. 'Oligoi' means a few and 'Pollein' , means to sell. Oligopoly represents the market situation where there are a few sellers of a particular commodity. The commodity is a differentiated one. In oligopoly, there are a few sellers whereas in monopoly there is only one firm in the market. It also differs from perfect competition and monopolistic competition where there are many sellers in the market. The actions of a seller in oligopoly will be reacted and taken into considaration by others in the market. He also reacts to the actions of others. In oligopoly, a single seller has got sufficient important position in the market. He will take the changes of other firms into consideration and determine price, output and sales activity of his product. The changes in the output and price of one firm will affect the amount of output and price of other firms. In oligopoly firms are interdependent whereas in perfect competition, firms are independent. **Duopoly** is the simplest case of oligopoly, where there are only two sellers.

Prof. Stigler defines oligopoly as the "situation in which a firm bases its market policy in part on the expected behavior of a few close rivals". According to Prof. Leftwich "An oligopolistic industry is one in which the numbr of sellers is small enough for the activities of a single seller to affect other firms and for the activities of other firms to affect him". For example, prior to nationalisation, the oil companies operating in india like Burma Shell, Caltex, Mobilgas represent an oligopoly.

16.12.2 Characteristics of Oligopoly

i) Very few sellers of the product : There are very few sellers in the market producing either homogeneous or differentiated products. Pricing and output of a single firm will influence the price and output of the industry. Each firm has large share of the market and it can affect the market activities by altering its output.

ii) Interdependence : Under oligopoly, actions of one firm will be reacted by other firms. Single firm will also take into account the actions of other firms. As there are close substitutes for the product, there is high cross elasticity of demand for the products.

iii) Presence of monopoly power : There are a few sellers in oligopoly, that is why collusion of firms is possible. When they come to an agreement, they will act as monopoly so that high price is charged for the product. They will enjoy more than normal profits by raising the price. In this manner, firms will enjoy monopoly power to some extent.

iv) Existence of price rigidity: In oligopoly, if any firm wants to reduce its price, it will be reacted by other firms. The other firms would reduce their prices to greater extent. With this type of price war no one will benefit. Suppose, on the other hand, a firm increases its price others will not follow the rise in price. Therefore, no one would like to decrease the price or to increase the price. Thus the firms will stick to the price which is called price rigidity.

v) Differentiated products: In oligopoly, firms produce diferentiated products which are close substitutes. When each has to stick to the prevailing price, it has to increase its sales by improving quaility and design and by spending more on advertising so as to attract the consumers' preferences.

Check Your Progress - 6

11. What is monopolistic competition?

12. List the main characteristics of monopolistic competition.

13. Explain the term 'oligopoly'.

14. What are the important characteristics of oligopoly?

16.13 Summing Up

So far, we have discussed how price and output are determined in monopoly and discriminating monopoly. We have tried to analyse the concepts of monopolistic competition and oligopoly. Monopoly indicates the existence of one producer, no substitute commodities and no competition. Monopolist can decide either the price or output of the commodity, but not the both. In the monopoly, the firm gets abnormal profits when price and output are in equilibrium. By understanding perfect competition and monopoly you can differentiate them on many grounds.

Monopolist can charge different prices from different consumers for the same product under monopoly price discrimination. He bifercates the market on the basis of elasticity of demand and sell the commodity at different prices. This enables him to earn more profits.

- Sri P. Rajesham

16.14 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. A. Koutsoyiannis : A Modern Micro Economics.

16.15 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the kinds of monopoly.
2. How are price and output determined under monopoly? Illustrate diagrammatically.
3. What is meant by monopoly price discrimination? State the conditions for price discrimination.
4. Explain diagrammatically the determination of price and output under discriminating monopoly.
5. What is monopolistic competition? What are its characteristics?

II. Answer each of the following questions in about 15 lines.

1. Explain the price determination under simple monopoly.
2. Explain and illustrate diagrammatically the distribution of given output under discriminating monopoly.

3. Explain the price and output determination under discriminating monopoly.
4. Explain the characteristics of monopoly.
5. What are the main forms of price discrimination?
6. Explain the kinds of monopoly?
7. Define oligopoly? Explain the characteristics of oligopoly.

BLOCK - VI

AN INTRODUCTION TO MACRO ECONOMICS

This block is a beginning for learning the macro economic thoery. The view points of classical economists on natural order, invisible hand, laissez-fair, self-mechanised market system, saving-investment equality, perfect competition, neutrality of money are explained in the Unit-17. In the next unit you will be learning about classical theory of employment, flexible wage structure, wage-cut policy of Pigou, Say's law of markets. The concept of effective demand introduced by keynes, components and determinants of effective demand are dealt in Unit-19.

Note: You are supposed to acquaint the knowledge on 'National Income Analysis' before learning 'Macro Economics'. Hence, may I take this opportunity to request you to read the block on *'National Income Analysis'* from Course - II of Economics entitled **'Economics of Development'**.

This block consists of the following 3 units :

Unit - 17 : Classical Economic Analysis
Unit - 18 : Classical Theory of Employment
Unit - 19 : Effective Demand

Unit -17 : Classical Economic Analysis

Contents

17.0 Aims and Objectives

The unit discusses some of the concepts used in clasical economic analysis such as the invisible hand and the self adjusting characteristic of market mechanism.

After reading the unit, you will be able to

* explain the principle of natural order,
* identify the concept of invisible hand,
* recall the emergence of division of labour,

* infer the equilibrium in the commodity market,
* discuss the automatic functioning of market mechanism with regard to unemployment, savings and investment , prices and money in circulation,
* list the assumptions behind the mechanism, and
* discribe the limitations of the market mechanism.

17.1 Introduction

If we go through the annals of economic history, we come across many 'groups' of economists putting forward divergent propositions on various economic issues confronting their contemporary society. Such groups are known as 'schools of thought'. For example Mercantalists, Physiocrats, Classical economists, Historical schools, Austrian group/ Utilitarians, Marginalists, Socialists / Marxists, Neo-classical or the Cambridge school, Keynesians, Post-Keynesians etc, . Generally economists who lived during a particular period of time and whose analysis stood on a set of common assumptions are bracketed as a 'group or a school of thought'.

Prior to the Keynesian era, of all the schools of thought the classicals commanded remarkable respect. Adam Smith, David Ricardo, Karl Marx, J.B. Say, J.S. Mill, Malthus etc., were most popular among the classicals. Till the emergence of the classical school of thought, the subject mater of economics was dealt with as an integral part of ethics, philosophy and plitics. The classicals had elevated the subject mater of economics to the status of an independent, useful and problem - oriented branch of knowledge, delinking it from other faculties.

Though the building up of the classical system was mainly the conscious effort of a team of economists, Adam Smith is generally regarded as the poineer of the analysis. He is also referred to by the later economists as the 'father of political economy'. As Charles Rist has rightly pointed out the appearance of the great work of Adam Smith's 'Wealth of Nations' in the year 1776, instantly eclipsed the tentative efforts of his predecessors. Probably he was the first economist who was destined to formulate many an original concept which formed the basis for further discussions, analysis and improvements.

17.2 The Principle of Natural Order

According to Adam Smith human behaviour is conditioned by certain natural instincts such as self-love, sympathy, the desire to be free, a sense of propriety, a habit of labour and the propensity to truck, barter and exchange one thing for the other, Given these instincts of conduct, each individual will naturally be the best judge of his own interest and should therefore be left free to pursue it in his own way. If left free he would not only attain what is best for him, but also help further common good . He also believes that there is a natural balance among the various instincts of the human beings and that he is capable of avoiding the conflict which is likely to arise between one's own self and the general good. Smith tried his best to skillfully push forward the philosophy of this natural order to the functioning of the economic institutions. Smith considered the economic system as an organism which was the result of the millions of individual wills unaware of the ultimate consequences of their own actions. He gave a multitude of illustrations, wherein it is shown as possible to attain what is best for an individual and at the same time help unawares to further the common good. He says, "there is no need of organisation, no call for intervention of general will however far-seeing and reasonable, and no necessity for preliminary understanding between men" ... The present

aspect of the economic world is the result of the spontaneous action of millions of individuals, each of whom follows his own sweet will, taking no heed of others, but never doubting the ultimate result".

17.3 Concept of Invisible Hand

Thus the shape of the present day economic world was designed and developed not by conscious effort of the governments or by the brain of an organiser and deliberately carried out by the members of the society. Then how did the whole system take shape? The concept of spontaneous evolution of the economic world suggests the existence of some guiding or vital force capable of issuing silent instruction to individuals like our present day computers . This guiding force is named by Adam Smith as 'invisible ' or 'unseen' hand, which is capable of assuming charge of the economic organisation, without being noticed by the mortal eye. This invisible hand prompts the individuals to act spontaneously and they do so in obedience for an instinctive force wholly unconscious of the consequences of their deeds. What is that instinctive for ce ? It is the natural efort of every individual to better his own condition, to accumulate more, to become rich etc. This instinct is hidden deep at the bottom of the heart of every individual and is the driving force behind the human endeavour and social progress. This natural tendency of the individuals bears positive seeds of common good. Hence all that the individuals do in their own self- interest, leads ultimately to general good . Another characteristic of the invisible hand is its self-correcting mechanism. All problems and contradictions that are likely to crop up in the functioning of the economic institutions are likely to be solved again under the guidance of the invisible hand without any outside interference.

17.4 The Emergence of Division of Labour

Smith cited the evolution and functioning of a number of economic institutions or phenomena as examples of the existence of the invisible hand and its self-correcting machanism. For example, take division of labour. According to Smith, labour is the ultimate source of all wealth. Wealth increases rapidly where there is division of labour and specialisation. Division of labour is of two types. One is simple division of labour and the second is complex division of labour. When one individual undertakes the production of an article completely, and exchange his production in return for all other commodities that he wants to consume, it is simple division of labour. Instead, when the production process of a commodity is divided into various bits and each bit is attended to by an individual or a group of individuals, we say that it is complex division of labour. In order to drive home the advantages of division of labour of the second type Smith cited the celebrated example of the manufacture of pins, which he had personally observed. He says that if the complete work of production of pins is undertaken by a single individual, he cannot produce more than one pin a day. On the other hand if the process is divided into 18 or 20 bits and each bit is carried out by a different labour with the help of some minimum capital he will be able to produce an average more than a pound of pins a day.

Then the question is, how did the institution of division of labour, which is responsible for the enormous increase in the production of the wealth, take its shape ? The marvellous institution of division of labour, says Smith is not originally the effect of any human wisdom, which foresees and intends that general opulence to which it gives occasion. It is the necessary, though very slow and gradual consequence of a certain propensity in human nature ... the propensity to truck, barter and exchange one thing for another. This propensity itself is the outcome of personal interest ; which acts simultaneously for the benefit of all". Thus, the division of labour is the result of the expression of

the natural tendency of labour is the result of the expression of the natural tendency of individuals...to barter what they have with what they do not have. Members of the society are prompted without any outside encouragement or interference to exchange each other's produce. No doubt this exchange is done only with a selfish motive and not with the intention of helping his neighbour. But even than the purpose is served. The wants of the community in general are attended to. Thus, according to Smith division of labour is a clear example of the operation of the invisible hand. Again in the words of Smith."it is not from the benevolence of the butcher, the brewer of the baker, that we expect our dinner, but from their regard to their own interest.

Check Your Progress-1

1. *Name a few classial economists.*
2. *What is invisible hand ?*
3. *What is the result of division of labour ?*
4. *How does the institution of division of labour take its shape ?*

17.5 Equilibrium in the Commodity Market

This is another, perhaps the more shining example of the self-adjustment characteristic of the economic institutions as illustrated by Adam Smith. In a complex economic system based on division of labour and specialisation , numerous individuals produce to the maximum possible extent, without any prior arrangement with regard to the exchange of their produce. They do not know who are likely to purchase their production. There is no external guidance to direct them. Then, how does the demand for, and supply of all the commodities generally get equalised ? The answer of the classicals is again obvious. The force which equalises the demand for and supply of commodities is the self-adjustment characteristic of the market mechanism. Their explanation is this. When a certain quantity of a particular commodity brought to market exceeds the demand for it, the whole of the commodity cannot be sold at the normal price. A part of it must be sold at a price which is less than the normal price. Consequently, when an attempt is made to reproduce the commodity, some of the factors are to be paid lower remunerations. If rent is reduced, land lords withdraw a part of their land. If it is wages or profits, labourers and entrepreneurs cutshort a part of their labour. Consequently, the quantity produced and brought to markt next time gets reduced. It would be no more than sufficient to supply the actual demand. The reverse will happen, if demand exceeds supply. When demand is more than the supply it will be sold at aprice higher than normal price. Profit margins increase, entrepreneurs compete among themselves to produce more. Consequently the demand for factors of production and their remunerations increase. Costs of production of the commodity and hence its price rise. Rise in the price decreases the demand for the commodity on a par with its supply. Either way the supply of any commodity has got to adopt itself to the existing demand. Among all other formulations of Adam Smith, the theory of adaptation, or the theory of self-adjustment charasteristic of the market mechanism is more important, and even to-day its validity is not completely ruled out.

Check Your Progress -2

5. *How is equlibrium achieved in the commodity market ?*

17.6 Growth of Population as per the Needs of the Society

Adam Smith found the operation of invisible hand and its self-correcting mechanism even in the growth of population. To the question what determines the size of the population of a country at any given time, Smith answers that it is the demand of the society for labour force. The demand for labour force obviously means the demand for more population. When the demand for labour is high, wage rates move up, marriages and multiplication take place unhindered, child mortality decreases and many people manage to reach maturity. Consequently, population increases in tune with the demand for it. Conversely when the supply of labour is more than the demand for it, wage rates decline. Poverty, illness and misery cause the death of many people; marriages and multiplications slack down. Population gets reduced to the extent that is warranted by the demand for labour. "It is, in this manner" writes Smith "that the demand for men, like that for any other commodity necessarily regulates the production of men; quickens it when it goes no too slowly and stops it when it advances too fast".

However it is to be remembered that Smith was not dogmatic with regard to the beneficient characteristics of the invisible hand or the concept of natural harmony. He said his conclusions were drawn from repeated observations. Moreover while giving various illustrations to push through his argument, he was often using the words "most frequently" and in a "majority of cases". He himself gave certain instance wherein individual and general interes. are likely to come into conflict. For example he entertained doubts with regard to the functio.ing o. merchants and manufacturers, land lords and capitalists. For example he remarked that land p.oprieters and capitalists "love to reap, where they have not sown". He was also of the op.ion that inequalities in social and economic position keep the proletariat in social and econom. p.sition keep the proletariat in a disadvantageous position while bargaining with the masters. He beli.ved that interest and rent are not hard-earned, but they are only deductions from the pr.. e .f labour.

17.7 Automatic Functioning of Market Mechanism

Classical economists right from Adam Smith down to Marshall and Pigou had unflinching confidence in the efficacy of the market mechanisam to bring about necessary adjustments in the economic system without being directed by any outside agency. They believed that all the economic problems which are likely to crop up from time to time, such as ... provision of employment to all the involuntarily unemployed factors of production, determination of prices in the commodity as well as factor market, equality between savings and investment, the problem of overproduction and underdemand of any particular commodity will automatically be got solved if we permit the market mechanism to function on its own accord.

Though the classical economists never defined precisely what is meant by market mechanism it may broadly be understood as the movement of economic variables such as demand, supply, prices, wages, profits, savings, investments etc., in a set pattern, so that we can assess how they react in the given circumstances. If left free whenever any economic problem arises or conditions of disequilibrium appear, all the concerned variables move in a quick succession and in such a precise manner that equilibrium is brought about again.

17.7.1 The Problem of Unemployment

Take for example the problem of unemployment in an economy. If the above mentioned economic variables are left free to choose their own course, all the unemployed would soon secure

employment. How does this hapen ?. As and when the number of unemployed swells, the supply of labour outstrips the demand for it . Competition among labourers to secure employment results in falling wage rates. As the wage rate falls the cost of production of the commodities decline resulting in lowering of prices. When prices come down demand for the commodities increases. Extended demand in turn induces the entrepreneurs to invest more; and more investment absorbs more labourers. Thus, ultimately the surplus labour is mopped up. In this way the problem of unemployment is solved as result of the operation of market mechanism ie., free movement of economic variables, like wages, prices, demand, investment , etc.

17.7.2 Equality of Savings and Investment

Say's 'law of markets', a most important postulate which formed the basis for further classical analysis , had as its background the strong belief in the functioning of the market mechanism. The law which says that every supply creates its own demand stands on the assumption that either people do not save at all, or even it they save, savings will automatically be equivalent to investment expenditure. How do savings become equal to investment ? According to classical economists, equality is brought about by the rate of interest. Rate of interest influences both saving and investment. . The higher the rate of interest the higher will be the savings, the lower the rate of interest, the lower will be the sagings. Likewise investment is also directly influenced by the rate of interest. The higher the rate of interest. the lower will be the investment, and the lower the rate of interest the higher will be the investment . Thus investment is inversely proportional to the rate of interest. This being the relation between savings and investment on one hand, and the rate of interest on the other, the latter is in a position to bring about equality in savings and investment. For example whenever savings exceed investment the rate of interest declines and the declining rate of interest encourages investment. As a result investment increases on par with savings. The opposit will happen if savings are lagging behind investment. If savings are less than investment, the demand for savings rises and consequently the rate of interest increases. An increasing rate of interest on the one hand encourages savings and on the other discourages investment. Consequently savings rise and investments fall till both of them are in equilibrium.

17.7.3 Determination of Prices

Like-wise there are questions such as who determines the prices of numerous commodities, how do the wages, rents and interest, (the remunerations) to the different factors of production get determined. Classical economists answer these questions in the same manner. No individual producer or individual seller is in a position to determine the price of any commodity. Like-wise no individual entrepreneur or individual unit of a factor of production is in a position to determine factor prices. It is the market mechanism or the interaction of the forces of demand and supply that determine the prices either of commodities or of factors of production. For example with regard to a particular commodity, if supply remains constant the higher the demand the higher will be the price, the lower the demand the lower will be the price. In the same way if demand is constant, the higher the supply the lower will be the price, and the lower the supply the higher will the price. What happens to the price if both demand and supply change ? If both demand and supply change, a new equilibrium price will be arrived at depending upon the relative strength of the forces of changed, demand and changed supply.

17.7.4 Adjustment of Quantity of Money in Circulation

Smith was of the opinion that even the quantity of money in circulation will be managed by the market mechanism whithout any outside interference or conscious planning on the part of the policy

makers. According to him people need money only to purchase goods. Hence it will suffice if the total quantity of money is equal to the value of goods to be sold and purchased. If the quantity of money is more than what is needed that means the value of output to be exchanged is less than the value of money in circulation, and some of the money is likely to remain idle . People by nature do not want to keep the money idle. Hence they try to get goods from abroad and the idle money be sent out against the imports. On the other hand if the quantity of money is less than the value of production, a part of it remains unsold. The unsold produce will be exported to other countries getting back some amount of money. Thus the money supply gets adjusted to its demand by the functioning of the market mechanism.

Check Your Progress-3

6. What do you understand by the term market mechanism ?

7. How do savings become equal to investment ?

8. How do the remunerations for factors of production get determined ?

17.8 Assumptions Underlying the Working of Market Mechanism

The market mechanism which seemed to classical economists as an all powerful instrument capable of solving all problems that are likely to arise in an economy stand on a multitude of assumptions. Only as long as these assumptions hold good the mechanism works. They are presented below:

17.8.1 Laissez -Faire Policy

The first and foremost assumption of laissez-faire policy is that the government should not interfere in the economic activities of the community. The maximum possible freedom should be given to the individuals with regard to the decisions such as, what to produce and how much to produce ; how much to be saved and how much to be consumed; what to invest and how to invest etc. Like-wise as less amount as possible should be collecteted by way of taxes. There should be neither surplus nor deficit budgeting. The Classicals are of the firm belief that, the government which governs least is the best, government activities should be limited to the extent of protecting the country from the external aggresion, maintaining law and order, taking up a minimum of public works such as communications and issuing of curency. Government should not have a specific policy with regard to pricing - whether of commodities or of factors of production. Prices may rule high or low, wage levels may rise or fall, profit margins may be normal or abnormal, there may be full employment or unemployment, the government should simply be an onlooker and should not shoulder the responsibility of correcting economic ills. For, the Smithian invisible hand could see to it that all the economic problems are corrected automatically without the interference of government. This stand is at present taken up by the monetarists led by Milton Friedman of Chicago School.

17.8. 2 Perfect Competition

Market mechanism works through the free play of market forces such as supply, demand etc. Free play of market forces in turn assumes the conditions of perfect competition in the commodity as well as factor market. Only under the conditions of the perfect competition the price of a commodity or a factor of production is determined by the interaction of the market forces of demand and supply

and not either by an individual seller or purchaser. For exampe, if the commodity market is dominated by monopolists, the prices will not be determined by market forces but will artificially be fixed by the producers. Like-wise in factor market if there are strong trade unions capable of pressuring the entrepreneurs to enhance the wages without corresponding enhancement in productivity again the wages will artificially be determined. Then wages do not reflect the changes that are taking place in the production mechanism. Economic structure loses its natural flexibility and becomes rigid. This will be a major obstruction for the free play of market forces. Hence the conditions of free and perfect competition are a must for the proper functioning of markt mechanism.

17.8.3 Neutrality of Money

Classical economists assumed that money is neutral as far as economic activities are concerned. They are of the opinion that things like production, distribution, exchange, employment etc., are in no way influenced by money. Money simply performs the functions assigned to it, to act as medium of exchange and as a measure of value. Money is meant only to avoid the disadvantages of barter system and thus ensure the smooth functioning of the economy. For example Adam Smith compares the role of money to a highway connecting the cornfields to the market area. The highway is very essential rather indispensible to transport the rural produce to the urban market. But the highway by itself cannot produce even a grain of corn or a blade of grass. Thus according to the classicals money has a very limited and neutral role to play.

17.8.4 Adherence to the Principle of Gold Standard

Gold standard means strictly linking the quantity of money in circulation to that of the stocks of gold and silver held by the currency-issuing authority. The quanity of money should rise and fall as and when there are fluctuations in the stock of gold. Classical economists were staunch advocates of this policy since it fitted in well within the framework of their economic policy. In the absence of gold stndard, governments issue currency, which amounts to interfering in the functioning of the economy. In addition, governments may also misuse their authority in which case the quantity of money will either be more or less than what is needed by the economy. If a country strictly adheres to the policy of the gold standard, the supply of money would get authomatically adjusted to its demand. Only then will the markt mechanism works well. As long as the clasicals were busy in formulating their theories, this policy was in practice in all the Western countries. Hence they took this policy for granted, and viewed this as an intergral part of their over-all economic analysis.

17.8.5 Free International Trade

This forms part of the laissez-faire policy of the classical economists. When the government is not supposed to hinder the freedom of individuals with regard to production, consumption, exchange etc., it goes without saying that it should not also put obstructions in the process of international trade. Whenever the occasion demands exporting and importing of commodities as well as capital, it is a must for the smooth functioning of the market mechanism. For example, in the absence of the free international trade, the policy of gold standard cannot be adhered to. In the absence of gold standard, the monetary system loses its strength automatically.

18.9 Limitations of the Market Mechanism

The concept of market mechanism which was so dear to the hearts of the classical economists, and on which they pinned their hopes as a saviour of all economic ills, is exposed to severe criticism by the modern economists. The assumptions on which the concept stands may be true to some

extent in the early days of capitalism when the economies were not so complex and the problems were not so numerous. But those conditions are not to be found in the modern capitalist economies, and as a consequence the potentiality of market mechanism has become very much limited.

17.9.1 Gone are the Days of Laissez-Faire

Now a days no government can afford to strictly pursue the policy of laissez-faire. No modern government can simply be an on-looker when the economy is exposed to severe economic problems such as unemployment and depression, inflation or deflation etc. Governments have been feeling it their sacred duty to interfere in the economic activities and set right the things. Modern Governments can survive only as welfare states, but cannot, as policy states as visualised by the classical economists. The activities of the Governments have been widening day by day and consequently the public expenditure, revenue and debt have ben steeply increasing. Balanced budgeting is more an exception than a rule. Once the Governments have started actively interfering in the economic activities of the nation, market mechanism has lost its automaticity.

17.9.2 We are Living in a World of Imperfect Competition

Conditions of perfect competition are not to be found even in the capitalist economies. Practically, we are living in a world of imperfect competitions. Monopolies, and monopolistic competitions dominate the commodity market. Hence there is no possibility of commodity prices being determined by the interaction of the forces of demand and supply. They are being fixed unilaterally by the producer. Like-wise in the factor market trade unions have not only emerged as a force to be reckoned with, but also enjoy the patronage of the governments. They never allow wage cuts even if the market conditions warrant such a move. Governments have, by and large, shouldered the responsibility of guaranteeing minimum wages and providing various kinds of reliefs to workers through social security measures. Some countries are even paying unemployment benefits. It is also not possible for the present day government to act otherwise ignoring the wishes of labour organisations. "It is bad politics" writes Dillard "even if it is to be considered good economics to object to labour unions and to liberal labour legislation". All these developments made the economies rigid and the market mechanism has failed to work automatically on its own accord.

17.9.3 Money is Dynamic but not Neutral

As expected by classicals money has never been neutral in the economic field. It is more dynamic and more powerful than any other economic instrument. It can immensely influence the pace of production, as well as the pattern of distrubition. If not properly managed it can create havoc. That is why it is said as long as we can control money it serves as a good servant. But once we lose control over it, it acts as master and that too as a bad master. The reason why classical economists considered money to be neutral is, perhaps, that they might have had in mind only the primary functions of the money ie., to act as a medium of exchange and as a measure of value. Had they properly recognised this aspect of money, they would not have deemed mney as neutral. Another reason for their belief in the neutrality of money might have been their assumption of full employment. In their view as economies will always be in full employment equilibrium, they thought that the changes in the quantity of money have nothing to do with production and employment. Then the change in the quantity of money results in a corresponding change in the level of price. Hence once we acccept that the assumption of full employment is far from the truth, the concept of neutrality of money loses its validity. If the money is not neutral the potentialities of market mechanism become very greatly limited and cannot automatically cure the ills of the economic system.

17.9.4 Days of Managed Paper Currencies

Gold standard was abandoned once for all. Throughout the world we have only managed paper currencies now. Managed paper currency implies not only interference but complete control of the monetary system either by the Government or any other agency authorised by the Government such as the Central Bank. Once this happened, the monetary system would no more be self-adjusting and that inturn very much limits the freedom of the market mechanism.

Check Your Progress -4

9. *List the assumptions underlying the working of market mechanism.*

10. *identify the important limitations of the markt mechanism.*

17.10 Summing Up

We have introduced macro economic analysis from this unit. This unit has explained some of the aspects dealt by the classical economists. Adam Smith is the father of Economics. He introduced many concepts such as principle of natural order, invisible hand, division of labour. According to the Classical economists, automatic functioning of market mechanism brings equilibrium in commodity market, employment market, investment market (between savings and investment) and quantity of money in circulation.

Most of the tools explained by the classical economists are not applicable to the present economic system which are complex. The assumptions made by them may be true to some extent in the early days of capitalism.

-Sri M. Ramachandra Rao

17.11 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. M.L. Seth : An Introduction to Keynesian Economics.

17.12 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the concept of invesible hand.
2. What is meant by market mechanism ? Why is it called self-correcting?
3. What are the pre-conditions that are necessary for the working of market mechanism ?
4. How is equilibrium attained in the commodity market, according to classical economists?
5. What factors are likely to limit the self-correcting nature of market mechanism ?

II. Answer each of the following questions in about 15 lines.

1. How does invisible hand decide the growth of the population ?

2. Explain the laissez-faire policy.
3. What is neutrality of money?
4. What is the principle of gold standard ? What is the alternative to it ?

Unit - 18 : Classical Theory of Employment

Contents

18.0 Aims and Objectives

The unit gives an idea about the thinking of the classical econmists with regard to some of the vital economic issues faced by the nations of the free world and how their analysis was subjected to criticism by the lather economists.

After reading the unit, you will be able to

* explain the major ideas / formulations of classical theory of employment, such as,
  - i) The concept of flexible wage structure,
  - ii) Pigouvian Wage-cut policy,
  - iii) Say's Law of market ; and
* criticise Say's law of market on many grounds,

18.1 Introduction to the Classical Theoru of Employment

According the classical economists normally economies possess the tendency to remain static at a position of full employment of labour and other factors of production. Full employment equilibrium is considered to be the normal situation and deviation from that position is considered abnormal or exceptional. They believe that the free play of economic forces or operation of the free and unhindered market mechanism has got the potentialty of bringing about fuller utilisation of factors

of production including labour. One may ask, how there can be full employment, if at any time the supply of labour is more than the demand for it? The answer of the classical is obvious. Free play of market mechanism is capable of bringing about equality in the demand for and supply of labour and solve the problem of unemployment. How does this happen ? If the labour supply outstrips the demand for it, competition among labourers to secure employment pushes down the wage rate. The declining wage rate result in the falling cost of production and the falling cost or production inturn helps to reduce the price level. A lower price level extends the demand and extending demand means more profits to entrepreneurs. More profits induce the entrepreneurs to invest more and to produce more. More profits induce the entrepreneurs to invest more and to produce more. More investment and more production provide employment to more labour.. Hence the surplus labour supply will also be absorbed, though at a lower wage rate. Hence there is no posibility of workers remaining unemployed provided they come forward to work at the given wage rate. The same is the case with all other factors of production. According to classicals providing employment to more resources will always be profitable and will be carried forward upto the point of full employment. This will happen as long as the factors of production are willing to accept rewards which are not more than their respective physical productivities. In other words, the process continues as long as the workers accept what they are "worth".

18.2 The Concept of Flexible wage Structure

Thus the classsical theory of full employment stands on one important assumption, that is flexibility in wage structure as well as in the general economic system. What is meant by flexibility in wage structure? Flexibility inwage structure implies that wages move freely either upwards or downwards depending upon the relative strength of the forces of demand and supply. For example, when labour supply exceeds demand, wages should come down and conversely when demand outstrips supply, wages should move up. Unless this happens the economic system cannot absorb the excess labour. Flexibility is essential not only in the wage structure but also in the general economic system. When wages move downwards cost of production and hence the price level should also decline soon. As a result of the declining price level the general demand for goods and services should extend. Entrepreneurs should readily come forward to take advantage of the extending demand. If they do not try to expand production, if there are barriers ... technical or legal ... for the expansion of output, increasing labour supply cannot procure employment.

To have flexibility in wage structure there should be no outside interference with regard to the determination of wages. They should strictly be determined as aresult of the interaction of the forces of demand and supply of labour. If trade unions are strong, capable of pressurising the entrepreneurs and pusshing the wages up, the wage structure gets rigid. Rigidity in the wage structure harms the tendency of full employment. The second likely hurdle in the way of flexible wage structure is the interference of the Government. If the Government shoulders the responsibility of guaranteeing minimum wages, or paying unemployment benefits, again the wage structure gets rigid and the market mechanism gets defunct.

Check Your Progress -1

1. *What does flexibility in wage structure imply ?*

2. *What are the conditions/assumptions for flexibility of wage structure ?*

18.3 Pigouvian Wage-Cut Policy

Pigou, a popular neoclassical economist argues that if the outside interferences are absent, if free and unhindered competition is encouraged in factor as well as product market, wages will get settled at the level which is profitable to the employers to offer work to all the involuntarily unemployed labourers. "With perfectly full competition" writes Pigou "there will always be at work a strong tendency for wage rates to be so related to demand that every body is employed". Pigou expresses the causal relationship oetween wages and employment in the form of an equation $N=\frac{q}{W}Y$ Where N stands for number of workers employed, q stands for that fraction of income received as wages, Y is national income, and W is money wae rate. It is assumed that q and Y remain more or less constant and hence the value of N is inversely proportionate to that of W. The value of N can automatically be raised if there is a fall in the value of W. This relation could also be explaine by the figure 18.1 given below :

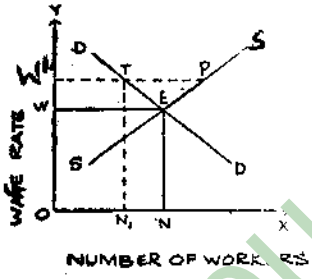


Fig. 18.1

The X-axis represents the number of wo ker. employed and the y-axis represents the wage rate. SS is the labour supply curve, and DD is the labour demand curve. E is the equilibrium point at which the demand and supply curves i sec each other. In this hypothetical economy wage level gets settled at OW and the number of work rs employed is ON. If the wage rate is increased to OW^1 either by government legislation or by trade union activities, the demand for labour is W^1T whereas its supply is W^1P. The Demand for labour is falling short of supply by PT. Hence the number of workers employed in this situation will be ON_1, which is less than ON, the previous level of employment, thus causing the retrenchment of NN_1 workers. To provide employment to the retrenched workers, the only way out is to push down the wage level back to OW from OW^1.

Henry Hazlitt, another classical economist of the present century is of the opinion that the prolonged unemployment of U.K. in the 1920's and that of the USA in the 1930's was not the normal characteristic of the capitalist system of society. On the other hand it was the consequence of wage rigidity for which growing militancy of trade unions and liberal government policy are solely responsible. Thus according to classical economists, if the society has no objection to lower the wages at a time of unemployment, all involuntary unemployment is bound to disappear. This clasical theory, therefore, was also called the theory of prices and fluctuations, since prices as well as wages are allowed to vary to maintain full employment.

Check Your Progress -2

3. *What is Pigouvian wage cut policy ?*

4. *Explain the causal relationship between wages and employment.*

18.4 Say's Law of Market

The clasical theory of full employment of resources is justified by Say's Law of Markets. Hence this law may be regarded as the core of classical economic analysis. The propounder of this famous law was J.B. Say, a French Economist. He put forward this simple, but most effective theory in his book *'Traited Economic Politiqe'*. The essence of the law is that *every supply creates its own demand*. In the words of Say, " it is production which creates the market for goods". The explanation of the law is very simple. Say assumes that people are prepared to work hard and produce goods only in order to enjoy the satisfaction of consuming them. Therefore in any economy based on division of labour, production is undertaken only to exchange it with other commodities. Therefore whatever is produced represents the demand for another product. This is so as long as barter system is in practice. This analysis holds good even after the introduction of money as medium of exchange and measure of value.

In a monetary economy, whenever a certain amount of output is produced and the price determined, an amount equal to the price has already been paid out as remunerations to the factors of production. The sum total of the factor incomes is exactly equal to the value of the output. Thus every additional output brought into existence simulataneously generates an equivalent amount of purchasing power. Hence whenever there is additional supply of goods, there will necessarily be an equivalent additional demand. Hence there is no possibility of goods remaining unsold for want of market. This does not mean that each additional worker need purchase exactly the same product which he has produced. It only means that the new income from his employment will create enough demand to take off the market an amount of output whose value is equal to that of his earnings. Even if people save a part of their income as long as prices are flexible and the savings can be converted as investment, Say's Law holds good.

"Nothing is more illogical" writes Say, "the total supply of products and the total demand for them must necessarily be equal, for the total demand is nothing but the whole mass of commodities which have been produced; a general over congestion would consequently be illogical". Acording to Say, congestion simply means a general over production in wealth, but wealth can never be too plentiful among nations, as is the case among individuals. He says that we may have inefficient application of the means of production resulting in shortage of some commodity and excess of some other commodity. But this will be corrected when entrepreneurs shift from the production of things that they cannot sell at a profit to the production of goods that they can sell at a profit.

He thought that crises in an economy were essentially transient in nature and declared that individual liberty would quite suffice to prevent all such disequilibrium. In his view production implies simply producing goods that are in demand and consequently if there is any excessive production, it is not the fault of the production as such and hence it cannot be regarded as over-production. "Produce all that you can" writes Say "and in the natural course of events, a lowering of prices will see to it that every production is purchased". Say's law is based on the assumption that all the incomes earned by factor owners is authomatically spent in the purchase of goods and services. He says that people do not desire money for its own sake. If they sell their produce for money, the money will promptly be spent against other goods. Even if we take note of the fact that people do save a part of their income prompted by their natural instinct, still the law holds good. Because in his view savings will automatically be invested, "Savings must equal investment ". If there is any inequality between savings and investment, it will be brought about by the market mechanism. i.e., the rate of interest. "Say's law in a very broad way" Writes Hensen " is a description of a free exchange

economy. So conceived, it illuminates the truth that the main source of demand is flow of factor income generated from the process of production itself".

The law is illustrated by the classiclas and their followers by giving many examples and similies. "When a car is manufactured wages, profits and payments for various services totallling together a sum equal to the price of the car is concomitant with the creation of an equal amount of purchasing power". In the words of Mc Connel "the very act of producing goods generates an amount of income exactly equal to the value of the goods produced, that is the production of any output would automatically provide the wherewithal to take that output off the market. Supply creates its own demand". James Mill in his *'Elements of Political Economy'* remarks that consumption is co-extensive with production; and production is the cause, the sole cause of demand. It never furnishes supply without furnishing demand , both at the same time and both to an equal extent. David Ricardo too, was of the same opinion. He also said that supply could never exceed demand and hence there could be no over-production. Thus all the classical economists held the view that full employment is ensured as long as Say's law – that the supply creates its own demand–holds good.

18.5 Criticism Against Say's Law of Markets

A debate ensued in the 1930's on the efficacy of this law in the light of the situation prevailing at that time, which was aptly called as **Great Depression** that led to serve unemployment and falling prices throught the capitalist world.

The Say's law of markets, which formed the basis for the whole structure of classical economic analysis was subject to scathing criticism by the later economists, especially by J.M. Keynes on the following grounds.

18.5.1 Rate of Interest cannot Equate Savings and Investment

The law that every production creates its own demand implies that every production is acompanied by necessary purchasing power to ensure its ultimate disposal. As such general over-production and under-consumption are impossible. The law assumes that all the incomes received by the people as factors of production will simulataneously be spent for the purchase of goods. Either they do not save at all out of their income, of, even it they save, the saving would soon be transformed into investment expenditure. Hence ultimately the over all demand for goods will be just equal to their supply.

To the question about how savings equal investment, the classicals answered that the market mechanism which is capable of conducting the economic systems towards equilibrium can bring about the equality between savings and investment. The mechanism operates here, it is said, in the form of rate of interest. According o the clasicals both savings and investment are interest-elastic. They get changed in response to every change in the rate of interest. For example, if savings exceed investment, interest rate declines and the declined interest rate encourages investment. Consequently investment goes up in tune with the level of savings. Thus the savings and investment become equal. The income which is likely to leak out as saving from the income-expenditure stream, will automatically rejoin the stream in the form of investment, and hence there is no possibility ofdemand lagging behind supply. In the words of Mc Connel "As the classical economists saw it, the economy was analogous to a gigantic bath tub, wherein the water mark measured the level of output and employment. Any leakage down the drain of saving would be returned to the tub through the spigot of investment. This had to be the case because the interest rate connected the drain pipe and the spigot".

But the foregoing analysis is not realistic. It may happen only in Robinson Crusoe economy where in money is non-existent, what is not consumed is saved; and what issaved is invested. But in a modern complex monetary economy savings do not automatically get converted into investment. Every saving need not be invested. It may be hoarded, or held in the form of cash to meet any unexpected contingency in future. Wicksell had demonstrated that even under these restrictive assumptions savings would not be equal to investment vice the changes in interest rate. The classicals believed that rate of interest is not that powerful enough to equalise savings and investment. In modern times neither saving nor investment is interest-elastic. According to J.M. Keynes, the level of savings depends upon income on one hand and the propensity to save on the other. Propensity to save being more or less constant in the shortrun, saving generally depends upon the level of income. The higher the level of income, the higher will be the savings. The lower the level of income, the lower will be the savings. But investment depends upon an altogether different set of factors. The major determinent of investment is expected profit rate or *marginal efficiency of capital* which is a most volatile factor and depends not on objective economic factors but on non-economic psychological factors. Again the people who save are different from the people who invest. All those who save cannot be investors. Only a limited section of the society ...traders and manufactures... undertake investment, where as anybody whose income permits him to save, does save. Thus when the people who save are different from the people who invest, and the motives behind saving being different from those of investment, the equality of savings and investment is only a rare phenomenon. Thus as rightly remarked by Mc Connel "Modern economists have proved themselves better plumbers than their classical predecessors by recognising that the saving drain and the investment spigot are not connected".

18.5.2 Price- Wage Flexibility is a Myth

Price-wage flexibility –another argument put forward by classical economists in support of Say's law of markets–is also vehemently criticised by Keynes and other modern economists. They argue that even if the rate of interest fails to bring about equality between savings and investment, the equilibrium of demand and supply would be arrived at in a diferent way i.e., by price-wage flexibility. According to the classicals the demand for commodities depends not only on the aggregate expenditure , but also on the level of prices. If demand starts decreasing as a result of decrease in total expenditure, competition among sellers to dispose of their stocks results in the reduction of commodity prices. Lower prices encourage people to purchase more and more. Ultimately the aggregate demand would be on par with the aggregate supply. Thus, according to the classicals, inequality in savings and investment-if at all it occurs-would simply result in a fall in the general price level, but cannot disturb the demand and supply equilibrium . It is pointed out by critics that declining commodity prices are bound to affect the profit margin adversely. The falling profit rate may in turn prompt the entrepreneurs to retrench some of the workers and to slash down production. Retrenchments and production cuts may lead to a further fall in aggregate income and expenditure and this may add fuel to the fire. Such a situation helps to deepen the crisis instead of solving it. To this, the classicals' answer is that the market mechanism in a free and perfectly competitive world does not work as pointed out by the critics. It functions in a different way. When commodity prices fall suddenly, no doubt it may immediately affect the profit margin. But very soon the demand for labour and other factors of production decline. Some of the workers are likely to become unemployed. But as the number of unemployed workes rise, competition among them results in a fall in wage level. Wages would sink to such a level, says Pigou, at which the employers would find it profitable to employ all the workers. Thus ultimately the fall in commodity prices does not adversely affect the profit margin and the production mechanism. It results only in the lowering of wages. In the game, the losers are labourers, but equilibrium in the economy does not get distrubed for long. Production will find its own demand.

The argument of Pigou stated above, is challenged by Keynes on two counts. Firstly, prices and wages are not that flexible to move downwards as soon as total expenditure declines. In the commodity market, monopolistic producers, who, by and large, dominate the present day capitalist economies, do resist any price cut. In the factor market the trade union have day by day become so strong that they can stall any move to push down the wages. Nowadays by and large Governments too are committed to guarantee minimum wages and they dare not antagonise trade unions. Hence price-wage flexibility is only an impossibility and is far from the truth. Secondly even if we agree that wages move downwards a a result of decline in total expenditure, it is not helpful to restore equilibrium at full employment level as expected by Pigou, since wage reduction means lower money incomes and lower money incomes in turn cause further fall in aggregate expenditure. Falling wages and declining agregate expenditure necessarily lead the economy towards depression. Thus the price-wage flexibility, says Keynes, if at all it is possible, can only help deepen the crisis instead of solving it. Thus the differences between classical economists and Keynes are fundamental in nature. While the classicals believed that employment depended upon the wage level and could substantially be increased by curtailing them, Keynes was of the view that employment and production depended upon the level of effective demand which could be maintained only by leaving the wages undisturbed. In fact, the root cause of the whole controversy is this. Wages play a dual role in the functioning of the economy. From one side they are costs, and from the other they are income. Pigou as well as other classicals viewed wages only from the point of view of costs; whereas Keynes understood them from the side of income. Hence Keynes vehemently opposed the very idea of wage cut to solve the problems of depression and unemployment, whereas the classicals thought it was only the solution to meet the crisis.

18.5.3 Extension of Partial Equilibrium Analysis to that of General Equilibrium is Unscientific

Another criticism against Say's law is that it amounts to extending partial equilibrium analysis of a firm or an industy to the economy as a whole. For example, take again the assumption of the classicals that a wage cut would help augment employment opportunities. It may be true in the case of a particular industry. Because, if wage rate declines in an industry, the cost of production decreases and goods may be sold at a lower price. Lowering of prices would push up the demand for the goods of that particular industry. Consequently the production is to be expanded employing more and more labourers. Thus employment opportunities as well as production are likely to rise as a result of wage cut in an industry. But when we take the whole economy as a unit i.e., when we extend our analysis from the micro level, the above reasoning does not hold good. A general wage cut in all the industries results in a steep fall in the purchasing power of the community. Even if the commodity prices decrease a little, as the income stream becomes slim, there will not be any effective demand to clear off the total supply. Thus low wage policy which can help boost the employment potentialities in a particular industry, is not applicable to the economy as a whole. Hence it is not correct to extend the micro-economic analysis to subjects which fall in the sphere of macro-economic analysis.

18.5.4 Economic History Disproves Say's Law

The Say's law was also disproved beyond doubt by the economic history of the capitalist countries. If the la were correct, if the supply could create its own demand, the capitalist countries would not have been exposed to a series of fluctuations in economic activity–at one time prosperity and at another time crises –called 'business cycles' thought the period of 19th century and the early 20th century. Classical analysis could not identify the reasons for the business cycles which were responsible for the halting progress of the Western countries. Fully convinced of Smith's theory of 'naturalism' the classicals thought that booms and depressions are natural occurances in an economy. They argued that as night follows day and day follows night, a boom is to be followed by a depres-

sion. The Great Depression of the 1930's which caused untold misery to the people of the free world, exploded the myth of the classical analysis based on Say's law. During that period of prolonged depression, over-production and under-consumption was a rule rather than an exception. Supply failed to create its own demand as theorised by Say and as zealously supported by his followers. The economic policies of some of the countries based on classical analysis and aimed at tackling the problem of unemployment failed to bear fruit during and after the Great Depression. Two such examples are the Bruming Experiment in Germany and the Lavel Plan in France, wherein the classical remedy of wage-cut was experimented upon to cure the depression. But in vain, this remedy instead of solving the problem aggravated it. Unemployment continued to mount day by day. The failure of these experiments showed how unrealistic the classical analysis turned out to be and those who still had some faith in classical theories till then,were fully convinced of its hollowness.

18.5.5 The Law was Contradicted by Classical Economists themselves

Not only Keynes and modern economists, but even a section of the classical economists generally known as 'pessimists' were also not convinced of the law. For example T.R. Malthus and Sismondi opposed the law and tried, though in vain to discredit it. "Let us beware" says Sismondi "of this dangerous theory of equilibrium (of demand and supply) which is supposed to be authomatically established. A certin kind of equilibrium, it is true, is re-established in the long run, but it is only after a frightful amount of suffering". Malthus had a protracted correspondence with David Ricardo, who was a staunch supporter of J.B. Say with regard to the validity of the said law. Keynes himself referred to this argument between the two classical economists saying "Malthus, indeed had vehemently opposed Ricardo's doctrine based on Say's Law of Markets, that it was impossible for effective demand to be deficient ; but vainly".

18.5.6 Say's Law and Socialist School of Thought

Say's law was also subject to criticism in the hands of the Socialist school of thought. As mentioned earlier, throughout the 19 th century, western economies experienced a series of crises, especially of over-production. The Classicals could not provide a satisfactory answer to this phenomenon. At best they could say that the crisis was only a transient affair or a passing phase. Socialists found an altogether different reason for the over-production crisis. According to them, the defective structure of the capitalist society and the unjust distribution of the national produce among the different sections of the society are responsible for the crises. In capitalist system the society mainly constitutes two classes of people capitalists and labourers. Capitalists being owners of the factors of production, knock away a lion's share . Entrepreneurs who get a major share in income do not consume all that they receive, but only save. Hence even if the workers spend all their income, the aggregate demand is likely to fall short of the aggregate supply resulting in the crisis of over-production and under-demand. The Classicals answered this criticism by saying that the savings of the entrepreneurs will also be spent soon on investment if not on consumption. As the aggretgate income is thus spent on aggregate production there seemed no possibility of a crisis. But as Karl Marx rightly remarked, investment expenditure can only postpone the crisis, but cannot abolish it altogether. Because investment expenditure means further addition to the productive capacity of the nation, and this addition cannot go unabated unless there is continuous growth in the demand to clear off the supply. History tells us that the capitalist countries were always in search of new investment opportunities and new markets. Socialists have also pointed out that this search for markets landed these countries in a series of international wars. The policies of colonialism and imperialism vigorously followed by the 18th and 19th centuries were designed with an eye on their national economic prob-

lems of over-production and under-demand. Great thinkers like Rosa Luxemburg, Hobson and Lenin had all emphasized this view.

18.5.7 The Assumption of Perfect Competition is Wrong

Say's law is based on the assumption of perfect competition in commodity as well as in factor market. This assumption is far from the reality. At present we live in a world of imperfect competition. Once this asumption is proved wrong, the theory which is dependent upon it loses its validity.

18.5.8 Long-run Equilibrium has only Theoretical Value

Say's law is also defined by some economists, saying that classical equilibrium is a long-run phenomenon. That means in the short-run there may be disequilibrium between demand and supply. But it is only a passing phase and in the long run supply has got to be equal to the demand. Critics argue that by and large people are interested in what happens now. They are not worried about what is likely to happen after a long time. As keynes had aptly remarked *"in the long run we are all dead"*. Long-run equilibrium analysis may have theoretical value, but does not have practical utility as it is not helpful to solve present day economic problems.

Economists of the early 20th century such as Tigan Baronowsky, Wicksell, Hobson, J.M. Clark etc., too refuted Say's law of markets. But their views were not received seriously. It was only after the publication of *General Theory*, in which Keynes systematically exposed the inconsistencies of the classical analysis, that academicians as well as policy makers started re-thinking about the validity of classical economics.

Check Your Progress- 3

5. *What is Say's law of markets ?*

6. *List the important limitations of Say's law of markets.*

18.6 Summing Up

This unit has dealt with the views on some important economic issues dealt by the classicals such as employment, wages and rate of interest. They assumed flexibility in wage structure to establish full employment in the economy. Pigou felt that employment could be increased by reducing the wages. Say's law implied that supply creats its own demand. But this law has been severely criticised by J.M. Keynes and other economists. They argue that rate of interest can not equalise savings and investment. The assumptions made by the classical economists and their theories based on these assumptions cannot be applied to the modern capitalist economies.

-Sri M. Ramachandra Rao

18.7 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. M.L. Seth : An Introduction to Keynesian Economics

18.8 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Summarise the views of classical economists on the level of employment of a nation.
2. Explain the Say's law of markets.
3. Analyse the Pigouvian wage-cut policy as a remedy to the problem of unemployment.
4. On what grounds did J.M. Keynes criticise the Say's law of markets ?

II. Answer each of the following questions in about 15 lines.

1. What is flexible wage structure ?
2. Is extending partial equilibrium to that of general equilibrium scientific ?
3. Is price-wage flexibility a myth ?
4. What does Say's law of market say?

Unit - 19 : Effective Demand

Contents

19.0 Aims and Objectives

This unit explains the concept of effective demand as formulated by J.M. Keynes and analyses its importance in the determination of national income and employment levels of a country.

After reading the unit, you will be able to

* define effective demand,
* list the components of effective demand,
* elaborate the determinants of effective demand,
* determine the effective demand through a diagram,
* analyse diagrammatically the full employment equilibrium,

* signify the importance of effective demand, and
* identify the emergence of macro economics.

19.1 Introduction

After systematically denouncing the shortcomings of the out dated and impracticable classical economic analysis, Lord Keynes propounded his own theory of employment in his epoch- making book **'General Theory of Employment Interest and Money'.** Very soon, the Keynesian theory of employment was widely accepted by the contemporary economists. The theory became so popular that the publication of the book containing it, was regarded as the beginning of a new period in the economic history of the world known as *'Keynesian -era'* . The revolt which he has spearheaded against the classical school of thought, the fundamental change that he has brought about in the very thinking of the contemporary economists with ragard to the functioning of the capitalist economy has earned the movement the name suggested by Lawrence Klien as*'Keynesian Revolution'*. His suggestions were implemented in some of the Western countries with a fair degree of success to combat the problems of depression and unemployment.

While formulating his theory of employment, Keynes put forward a number of new economic concepts such as effective demand, consumption function, marginal and average propensity to consume, investment multiplier, marginal efficiency of capital, liquidity preference, inflationary gap etc. These new concepts of keynes are known as *'tools of Keynesian economic analysis*. Making use of these tools which he has so skillfully developed, Keynes fabricated the theory of employment which became a land mark in the history of economic thought. Of all the new concepts mentioned above effective demand may be regarded as the kingpin, capable of playing a key role in the determination of national income and employment. According to Keynes, national income and employment of a country directly depends upon the level of effective demand. The higher the level of effective demand, the higher will be the level of employment and vice versa. Hence in his **'Economics of J.M. Keynes'**. Dillard remarks that the logical starting point of Keynes theory of employment is the principle of effective demand.

While trying to understand the Keynesian analysis , one must also be aware of the assumptions upon which his theories stand. Keynesian economic analysis is primarily short-run in nature. He is not worried about what is likely to happen after a long time. He is interested only in pointing out how things stand to-day. Hence he assumed that capital equipment, labour force as well as labour efficiency , money supply etc., remain constant. Accordingly he theorised that the national output or national income is a function of employment. When all other factors capable of influencing production remain constant, to raise national output or income, the only way is to raise the level of employment. If we employ more labour, they produce more and the output will be higher. If we employ less labour, they produce less and the output will be lower. Thus in his view an increase in employment means, an increase in national income and vice-versa. Hence the Keynesian theory of employment is almost synonymous with his theory of income determination.

19.2 Meaning of Effective Demand

Before going on to grasp the meaning ot the term 'effective demand ' we must distinguish it from 'aggregate demand.' Generally speaking *aggregate demand* means the total demand for all the goods and services put together. In terms of expenditure it is equal to the total money spent on

investment and consumption. But keynes used the term aggregate demand to denote the total demand for all goods and services at various levels of employment. At different levels of employment, there will be different levels of aggregate demand. The higher the level of employment, the higher will be the level of aggregate demand, and the lower the level of employment the lower will be the level of aggregate demand. But there will be a particular level of employment, depending upon the conditions of the economy, at which the aggregate demand equals aggregate supply. That particular level of aggregate demand at which it becomes equal to aggregate supply is called *effective demand.* In the words of Keynes "The value of D (aggregate demand) at the point of aggregate demand function, when it is intersected by the aggregate supply function, will be called the effective demand"

19.3 Components of Effective Demand

As explained earlier, effective demand represents the total money spent on consumption and investment at the given level of employment. The total money spent on consumption and investment is equal to the national expenditure. So the effective demand is equal to the national expenditure. As national expenditure is equal to the value of the total output, effective demand is also equal to the national output. In the same way, as the value of the national output is equal to the national income, effective demand is equal to national income too.

Effective Demand = Consumption expenditure (+)
Investment expenditure,
= National Expenditure,
= National output
= National income.

Thus the components of effective demand ... consumption expenditure and investment expenditure ... are also the components of national icome. To these two kinds of expenditure or components, post -Keynesian economists are adding two more. They are government expenditure and foreign trade surplus, which is equal to the difference between exports and imports. Then Y = C+ I +G+X-M, where Y stands for national income which is the equivalent effective demand, C stands for consumption expenditure, I represents investment expenditure, G denotes Government expenditure, X stands for exports and M for imports. The components of effective demand, mainly consumption and investment expenditure are discussed at length from different angles in the other chapters. Hence for the present they are dealt with very briefly and to the extent they are needed.

19.3.1 Consumption Expenditure

The main source fo consumption expenditure is the level of income. Given the propensity to consume, consumption expenditure vaies directly with the level of income. The higher the level of income, the higher the consumption expenditure and vice-versa. In addition to the current income, some times consumption expenditure will also be made up of past savings of the households, as people may make use of their past savings for their present consumption expenditure, especially while purchasing durable consumer goods. Moreover, nowadays after the hire purchase system has become popular, durable consumer goods are also being purchased either by loans obtained from banks or on credit basis, to be paid in future instalments . Either way the present consumption expenditure is likely to be more than the present income level .

19.3.2 Investment Expenditure

On the other hand investment expenditure is independent of the level of income. According to Keynes even though investment depends upon two things... rate of interest and marginal efficiency of capital ..... in the shorturn rate of interest remains constant and hence the investment expenditure depends on the marginal efficiency of capital. Marginal efficiency of capital in turn depends on the supply price of the capital and prospective yield. Again in the short run supply price does not change, and it is the prospective yield which changes so often, bringing about a consequential change in the level of investment. Prospective yield is nothing but the expectations of the entrepreneurs with regard to future profit margins and it is purely a psychological factor. For example if an entrepreneur feels rightly or wrongly that a particular type of investment is likely to fetch huge profits in future and start investing, many others may also follow him. Consequently the total investment expenditure increases rapidly. And the opposite may also happen leading to a fall in investment expenditure. Hence of all the components of the effective demand, investment expenditure, bank deposits created by the commercial banks play an important role. Entrepreneurs generally meet their investment expenditure partly from their own savings and largely from the loans obtained from banks. If the prospective yield is encouraging and if the central bank does not come in the way, creation of credit goes on unabated and the investment expenditure mounts. But generally Central Banks keep a close watch on bank credit. At any time they may direct the commercial banks to control such credit expansion. Hence the flow of ivestment expenditure will not be consistent and continuous. It may either rise or fall without any substantial or scientific reason. Even to-day the econometricians with all the tools at their control, are unable to unravel the the factors that influence investment demand.

19.3.3 Government Expenditure

The nature of Government expenditure is quite different from the above two types. It is purely autonomous, in the sense that it is not influenced so easily by external factors. The government expenditure depends upon the policies of the government and the degree of responsibility that it shoulders with regard to the welfare of the society. However, since the beginning of the present century the functions of the governments in general have been widening and consequently the public expenditure has been mounting year after year. Hence the government expenditure has also become an important or major component of the effective demand. A part of the government expenditure is towards consumption goods and a part towards investment goods . So government expenditure is partly consumption expenditure and partly investment expenditure. But, as mentioned earlier the factors governing private consumption and private investment are quite different from the factors influencing Government expenditure.

Government expenditure is financed normally by its revenue collected by way of taxes, fees, special levies etc. If the money received as revenue is not sufficient, as is generally the case, Governments borrow from inside and outside the country to meet the expenditure. Because unlike the households, Governments determine their expenditure first and then strive to tap different sources to meet that expenditure. Hence if the amount collected by way of taxes, plus the borrowings fall short of the expenditure, governments undertake deficit financing too, which is normally done by printing more notes and putting them into circulation.

19.3.4 Foreign Trade

Though not a major one, the forth component of effective demand is the surplus in the foreign trade. The importance of this component varies from country to country.

19.4 Determinants of Effective Demand

As mentioned earlier, in order to explain the principle of effective demand Keynes made use of two new concepts known as aggregate demand function of price and aggregate supply function of price . These two concepts may be called Keynesian 'blades of Scissors' analogous to the Marshallian 'blades of Scissors' of demand and supply. Hence the concepts need further elaboration.

19.4.1 Aggregate Demand Function

In general, *demand* means a schedule showing various quantities of a commdity which will be purchased at different prices. Here we express the quantitative relationship between the price of a particular commodity on one hand and the quantity demanded on the other. The demand for a particular commodity, or the demand for the product of a particular firm or an industry is understood in this sense. But the term *aggregate demand price* stands on a different footing. "The aggregate demand price or the output at any given employment" writes Dillard "is the total sum of money or proceeds which is expected from the sale of the output produced when that quantituy of labour is employed. Thus the aggregate demand price is the amount of money which all the entrepreneurs in the economy taken together do expect that they will receive by selling the output produced at that particular level of employment. To put it otherwise it refers to the total receipts expected from the sale of output at any given level of employment. Different levels of employment in the economy wil have different aggregate demand prices. The higher the level of employment, the higher will be the level of aggregate demand price .The lower the level of employment , the lower will be the level of aggregate demand price. Thus the level of employment and the aggregate demand price, move unidirectionally.

A detailed statement showing different aggregate demand prices at different levels of employment is known as the *aggregate demand price schedule* or *aggregate demand function*. In the words of Keynes , "The aggregate demand function relates at any given level of employment, to the expected proceeds from that level of employment". A model aggregate demand schedule is given here under. In the first column the level of employment (N) , or the number of labourers employed, and in the second column, the aggregate demand price (D) or the expected sale proceeds at that particular level of employment are shown. According to Keynes the aggregate demand function is an increasing function of the level of employment. The relation between the two may be expressed as $D = F(N)$, where D stands for the expected sale proceeds and N stands for the number of people employed. As shown in the table below, when 10 lakh workers are employed, the aggregate demand price is Rs.50 crores. As the level of employment rises from 10 to 20 lakhs and from 20 to 30 lakhs the aggregate demand price increases from 50 to 100 crores and from 100 to 150 crores respectively. The rise in the aggregate demand price is steep upto 60 lakh workers and after that level it slows down.

An aggregate demand curve may be drawn on the lines of the above information. The shape of the curve will be as shown in the diagram 19.1. The curve slopes upwards from left to right indicating the functional relationship between the level of employment and the aggregate demand prince. It is to be noted that the shape of the aggregate demand price curve is just opposite to that of the ordinary demand curve.

Table - 1: Aggregate Demand Schedule

Sl. No.	Level of employment (or) the number of workers employed (in lakhs)	Aggregate Demand Price (or) the expected sale proceeds (in crores of rupees)
1.	10	50
2.	20	100
3.	30	150
4.	40	200
5.	50	250
6.	60	300
7.	70	330
8.	80	350
9.	90	360
10.	100	365

Fig- 19.1: Aggregate Demand Curve

The number of labourers employed is shown on OX-axis and the aggregate demand price on the OY-axis. As shown in the diagram when the number of labourers employed is ON, the corresponding aggregte demand price is OD. When the number of persons employed rises from ON to ON' the aggregate demand price increased from OD to OD'. Like wise when the numebr of workers employed decreases from ON to ON" the aggregate demand price decreases from OD to OD"

19.4.2 Aggregate Supply Function

Whenever entrepreneurs undertake production employing a certain number of workers they have to incur many expenses such as purchase of raw materials, payment of wages, interest and rent etc. They have to pay taxes to the Government and also expect some profit for themselves from the sale proceeds. All these expenses are money costs of production. Unless the entrepreneurs receive the money costs of productin or the total expenditure including the minimum profit, they do not come forward to produce the commodity again. Even if they come forward, they reduce the level of production and retrench some of the workers. Hence, to keep the entrepreneurs in the production activity, and to maintain a particular level of employment, a certain minimum sale proceeds are must. That minimum receipts which the entrepreneurs must receive from the sale of output at a given level of employment may be called *aggreagate supply price.*

Thus, the aggregate supply price is the total amount of money which all the entreprenuers in the economy taken together must expect to receive from the sale of the output, produced by a certain number of workers, in order to make it jsut worthwhile to employ that given number of workers. In the words of Dillard " the minimum price or proceeds, which will just induce employment on a given scale, is called the aggregate supply price of that amount of employment.

If the entrepreneurs employ more labourers and produce goods on a large scale, total expenses or money costs of production will be more. On the other hand, if they employ less labour and produce goods on a lower scale level, the total expenses wil be less. Hence the sale proceeds which the entrepreneurs must expect, or the aggregate supply price, varies with every change in the level of employment. Different levels of employment do have different aggregate supply prices. A statement showing different levels of employment and the corresponding levels of aggregate supply prices, is known as *aggregate supply function* or *aggregate supply price schedule.* Again in the words of D. Dillard "The aggregate supply function is a schedule of the minimum amounts of proceeds required to induce varying quantities of employment.

A model aggregate supply schedule is furnished here under. In the first column the varying levels of employment and in the second column aggregate supply prices corresponding to each level of employment are shown.

Table - 2: Aggregate Supply Schedule

Sl. No.	Level of employment (N) (in lakhs)	Aggregate supply price (in crores of rupees)
1.	10	25
2.	20	80
3.	30	135
4.	40	190
5.	50	245
6.	60	300
7.	70	350
8.	80	410
9.	90	490
10.	100	500

As shown in the above table the aggregate supply price rises with every increase in the number of workers employed. This means that if the entrepreneurs are to provide employment to more and more labourers, the sale proceeds which they must receive should rise correspondingly. When the level of employment rises from 10 to 20, from 20 to 30, and from 30 to 40 lakhhs of workers, the aggregate supply price increases from 25 to 80 crores, from 80 to 135 crores and from 135 to 190 crores respectively.

According to Keynes, the aggregate supply function is an increasing function of the level of employment. This relationship may be expressed as $Z = f(N)$ where Z is aggregate supply price of the output from employing N men.

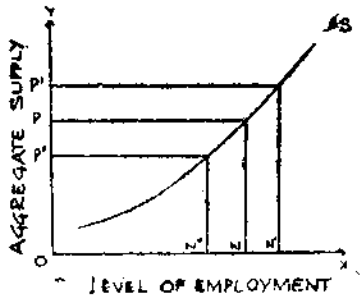


Fig- 19.2: Aggregate Suply Price Curve

The aggregate supply curve may be drawn as in figure 19.2on the lines of the schedule given above. The number of men employed are shown on the X-axis and the sale proceds are shown on the Y-axis. In the figure 19.2 the aggrtegate supply curve slope upward from left to right indivating the relationship between the level of employment and the amount of sale proceeds. When ON number of workers are employed, the entrepreneurs should receive OP sale proceeds. As the number of men employed increases to ON' the sale proceeds, they must receive, increase to OP' Like wise when the level of employement falls down to ON" the sale proceds which the entrepreneurs should receive drops down to OP". At first the ASP curve rises slowly and then after a point it rises sharply, indicating that the cost of production will be low as production expands, but once the production croses the optimum level, the costs rise very steeply. For at that level, the economies of large scale production turn out to be diseconomies.

Check Your Progress -1

1. *What is effective demand ?*
2. *What are its components ?*
3. *What are the determinants of effective demand ?*
4. *What is aggregate demand price ?*
5. *What is aggregate supply price ?*
6. *What is Keynesian era ?*
7. *What do you mean by Keyresian revolution ?*

19.5 Determination of Effective Demand

In the preceeding paragraphs we studied in detail the two determinants of effective demand,namely, aggregate demand price and aggregate supply price. However care must be taken with regard to their meanings, as they could cause some confusion in definition. To repeat once again, *aggregate supply price* is the amount of money which all employers taken together *must expect to receive* to induce them to maintain a particular level of employment . *Aggregate demand price* is the amount of money which the entrepreneurs *do expect to receive* by the sale of the produce at varying levels of employment. Thus one is the amount which the entreprenuers must receive, where as the other is the amount which they expect to receive.

As mentioned earlier ADP and ASP are the two determinants of effictive demand. As the *price of the commodity* is determined by the interaction of the two forces of demand and supply, the *effective demand* is also determined by the interaction of the two forces–ADP and ASP. Effective demand is determined at the point where ADP is equal to ASP. This is the point of equilibrium where, what the entreprenuers expect to receive is equal to what they must receive. Here the entreprenuers reap maximum profits. The level ofemployment in the economy is determined at this equilibrium point. Entrepreneurs employ only as much labour as corresponds to the level of effective demand . If they employ either more or less labour than what is indicated by the point of effective demand, either they forego some of their profit or sustain loss. This is because, if entrepreneurs stop employing labourers prior to reaching this point of effective demand, they are stopping production in a zone where ADP is higher than ASP. That means the amount which they are expecting to receive (revenue) is more than the amount which they must receive (costs of production). Hence the prospects of earning some more profits are greater when they employ more workers. Naturally the entrepreneurs wish to employ more labourers and expand production upto the point of effective demand. So the level of employment in the economy cannot stand at a point lower than effective demand. The employment level cannot also be pushed forward beyond the point of effective demand,because beyond this level ASP is more than ADP. This is, what they must receive is more than what they expect to receive indicating that the total costs are higher than the total revenue. They sustain losses if they employ more labourers. Hence entreprencurs do provide only as much employment as corresponds to the effective demand.

The analysis given above may be illustrated with the help of table -3 It is not new one but only integrates the aggregate demand schedule and aggregate supply s chedule given earlier. As shown in the table ADP is equal to ASP when 60 lakhs workers are employed. At that level ADP of Rs. 300 crores is equal to that ASP of Rs. 300 crores, and this is equilibrium point or the level of effective demand. Entrepreneurs get maximum possible profit only when they provide employment to 60 lakhs workers. If they stop providing employment at a level lower than 60 lakhs as ADP> ASP, entrepreneurs forego some of the profit which they are likely to get. For example, if they employ 40 lakhs instead of 60, ADP is 200 crores, where as ASP is only 190. Still there is a profit margin of 10 crores. So they do not stop employing workers below this level. On the other hand, if they provide employment to more than 60 lakhs workers, as ASP>ADP, they are bound to sustain loss. For example if they provide employment to 80 lakh workers. ASP is Rs. 410 crores where as ADP is only Rs. 350 crores. So they sustain a loss of 60 crores. Hence they provide employment to only 60 lakhs of workers. In this example ADP of Rs. 300 crores which is equal to the ASP is the effective demand.

Table - 3: Schedule of Aggregate Supply and Aggregate Demand

Sl.. No.	Level of Employment (in lakhs)	ASP (S) in crores	ADP (D) in crores
1.	10	25	50
2.	20	80	100
3.	30	135	150
4.	40	190	200
5.	50	245	250
6.	60	300	300
7.	70	350	330
8.	80	410	350
9.	90	490	360
10.	100	500	365

The determination of effective demand may also be explained with the help of a diagram as given below in the figure 19.3.

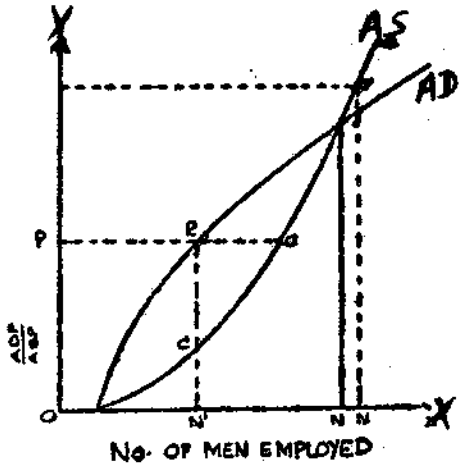


Fig. 19.3

The OX-axis represents the total number of men employed and the OY-axis represents both the aggregate supply price (receipts) and the aggregate demand price (receipts). As is the aggregate supply price and AD is the aggregate demand price curve which have already been explained earlier. Both the curves slope upwards from left to right. But there is a vast difference in their slopes. In the beginning the ASP curve goes upward slowly, but after a point it rises very steeply. The slope of the curve indicates that in the initial stages of production, costs increase slowly as a result of the economies of the large scale production. But as the production expands beyond a particular level known as optimum level, the economies of large scale production become diseconomies and as a result the total costs of production start rising very steeply. On the other hand, the ADP curve rises steeply in the initial stages of production and its steepness gets reduced after a particular level of output and employment. It indicates that in the beginning when only a limited number of workers are employed and production is carried out on a limited scale demand will be much greater than supply and consequently the expected sale proceeds of the entrepreneurs will be very high. But as the entrepreneurs engage more labourers and expand production on a large scale, supply is likely to become equal to or even more than the demand for it. At that stage the expected sale proceeds start declining.

As is evident in the diagram, for each level of employment there will be an aggregate demand price (ADP) and an aggregate supply price (ASP). Up to a certain level of employment i.e., upto ON in the diagram, the ADP > ASP and after that level ASP > ADP. At that particular level ADP = ASP, i.e., the sale proceeds or receipts expected by the entrepreneurs are equal to the amount which is essential to induce them to keep up that particular level of employment. This will be the point of intersection between the ADP and ASP curves. This point of intersection or equilibrium indicates the quantum of effective demand and at the same time determines the actual level of employment.

In this hypothetical economy and in the given circumstances only ON workers will get employment. This is so because of a number of reasons. Let us see what happens if the entrepreneurs employ ON' men instead of ON. Then the ADP or the expected sale proceeds are NR, whereas the ASP or the recepts that are essential to employ ON men are only N'C . N'R is much greater than N'C. Profit margin becomes wide. Entrepreneurs compete among themselves to knock away that profit by employing more men and by producing more output. This trend pushes up the level of

employment to ON. On the other hand if ON" men are employed instead of ON, the receipts which are essential to meet the expenses of production are N"C ', whereas the expected sale proceeds are only N"R'. N"C' >N"R'. They sustain losses and hence they retrench some of the workers bringing down the level of employment to ON. Hence in the given circumstances, E is the equilibrium point or Effetive Demand and ON will be the level of employment.

Check Your Progress -2

8. *How is effective demand determined ?*

9. *Show the determination of effective demand on a graph.*

19.6 Full Employment Equilibrium

In the example analysed above we have seen that only ON workers could be employed. Because that is the level of employment corresponding to effective demand or the equilibrium between ADP and ASP. But this equilibrium need not necessarily be at the level of full employment. That means there may still be unemployed workers in that hypothetical economy. The question is how can the entreprenuers be induced to provide employment to those unemployed ? Or to put it technically, how can they arrive at full employment equilibrium ? As long as the original equilibrium holds good, entrepreneurs do not change the level of employment. for as seen earlier, if they do so they sustain losses instead of getting profits.

Hence the only way out to arrive at the new and the full employment equilibrium is to affect a shift either in the ADF, or in the ASF, or in both. According to Keynes, in the short run it is not possible to shift the position of ASF as it depends more or less on technical grounds such as the production process, managerial ability, labour effeciency, technological progress, availability of raw materials, supply of machinery and spare parts, etc.

Hence it is the ADF which is more flexible and is capable of playing a vital role in determining the effective demand and thereby the level of employment . So, to raise the economy to the level of full employment equilibrium, the ADF is to be shifted upwards. ADF in turn depends upon the consumption function and investment function. To raise the ADF, either the consumption function or the investment function is to be pushed up. Again according to Keynes in the short run consumption expenditure is sticky, and investment expenditure is flexible. Ultimately only by raising the ivestment expenditure it is possible to shift the ADF upwards. By shifting the ADF upwards we arrive at the new equilibrium as shown in the diagram 19.4. E is the point of original equilibrium or effective demand and ON is the corresponding level of employment. Now suppose we want the employment

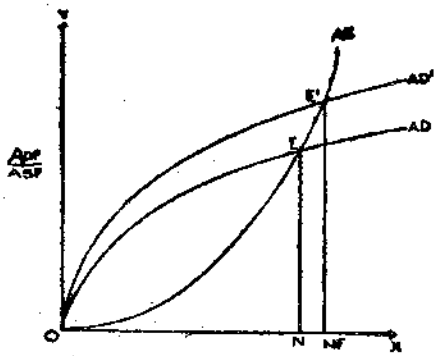


Fig. 19.4

to be increased to ON_F, which is the full employment level. To arrive at this ful employment equilibrium acording to Keynes the only way is to raise the ADF from AD to AD' as shown in the diagram. Now the intersection of the old ASF and the new ADF takes place at a higher level E'. This is the new point of effective demand which can provide employment to ON_F workers. This new equilibrium is the full employment equilibrium. If the ADC is still shifted up- wards in such a way that it intersects the ASC at a level higher than the E' the economy will have to face inflationary conditions. Because beyond the level of full employment, ASC becomes vertical and whatever might be the quantum of effective demand, production cannot get expanded. As all the resources are already employed every addition to demand only deepens the crisis.

Check Your Progress -3

10. *How can full employment equilibrium be derived ?*

19.7 Importance of Effective Demand

The most important contribution of Keynes to the stream of economic thought is the principle of effective demand. According to economists like Klein the principle of effective demand made Keynes the greatest economist of the 20th century and because of this theory his economic analysis earned the titile 'Keynesian Revolution' as mentioned earlier.

19.7.1 Determinant of Employment

Until keynes formulated the theory of effective demand there was no satisfactory answer available with the economists to the question how the level of employment is determined in an economy. Based on the Say's law of markets, classical economists firmly believed that determination of the level of employment is not a problem at all. In their view the very nature of the functioning of an economy sees to it that there will always be full employment . The prevalling unemployment in Western countries was understood by them either as a transitionary phase or the result of some outside interference in the functioning of the economy. But the experience of capitalist countries particularly the acute unemployment of the 1930's which encompassed almost all the capitalist economies proved beyond doubt that the classical analysis was far from reality. Economists were about to cut a sorry figure because of their inability to properly analyse such a grave practical economic problem. At such a crucial juncture came the Keynesian theory of effective demand. According to Keynes effective demand determines the level of employment in the economy. The higher the level of effective demand the higher will be the level of employment. It follows that the problem of unemployment generally faced by the Western countries is neither a passing phase nor the consequence of government interference as expected by the classicals, but is the result of deficiency in effective demand. At the same time, two other Europen economists Kelecki of Poland and Gunnar Myrdal of Sweden also propounded almost the same analysis, where lack of effective demand and hence entrepreneurs expectation not being realised is cited as the prime cause for unemployment and consequent critical fluctuations in economic activity.

According to Keynes in the short run all other things such as technology, capital stock, managerial talents etc., will remain constant and national output and national income directly depend upon the level of employment. As the quantity and quality of all other factors of production remain constant, if we employ more labour they produce more and hence the national output and national income increase. If we retrench some of the workers , production drops down and hence the naional

income declines. Thus effective demand, as the determinant of the level of employment, also determines indirectly the level of national output and income.

19.7.2 Repudiation of Full Employment Equilibrium of Classical Economists and Say's Law of Markets

According to classical economists, economies are generally in equilibrium at the full employment level. As every supply creates its own demand, there is no possibility of any production remaining unsold for want of market. As every commodity that is produced is sold, entrepreneurs carry on the production to its logical end employing all the available factors of production including labour. Hence there is no chance for under employment equilibrium in any economy. But the principle of effective demand points out that underemployment equilibrium is a normal situation and full employment equilibrium is only an exception. Hence Keynes calls this a general theory of which classical theory is a special case. In a capitalist economy supply cannot produce its own demand for the total income that is generated along with porduction will not be spent. There are many hindrances, and leakages in the income-expenditure flow. As the income increases, consumption expenditure also increased but not on par with the increased income. So the effective demand which is the sum total of consumption expenditure, plus the investment expenditure cannot keep pace with the growth in national output. Consequently some of the production is likely to remain unsold.

19.7.3 Repudiation of Pigouvian Principle of Wage Cut

According to prof. Pigou, a neo-classical economist the problem of unemployment can be solved by reducing the wage rates. When wage rates are reduced, cost of production comes down, prices decline and as a result of that, demand for the commodities increases. As the demand is increasing entrepreneurs are induced to employ more labour in order to expand production on a par with the demand. Thus acording to the classicals wage cut is the proper answer for the problem of unemployment. The Keynesian principle of effective demand, repudiates this analysis. Whenever wage rates are decreased, the incomes of the wage earners fall. As their incomes fall they spend less on consumption goods and hence the total consumption expenditure declines . As a result, the effective demand which is dependent upon consumption expenditure goes down whenever effective demand decreases entrepreneurs try to cut back production retrenching some of the workers pushing down the level of employment. Hence as per the principle of effective demand a wage cut instead of solving the problem of unemployment will intensify it.

19.7.4 Role of Investment

As mentioned earlier the effective demand is determined by aggregate demand which is composed of consumption expenditure and investment expenditure. According to the *Keynesian Psychological law of consumption* when income rises, consumption expenditure too rises but less than the rise in income. Thus as incomes rise there results a gap between demand and production, which in turn leads to a fall in the level of employment. This gap widens as the level of income increases. This gap could be filled either by raising consumption expenditure or by raising investment expenditure. Consumption expenditure. Which depends on the level of income on one hand and the propensity to consume on the other remains sticky in the shortrun. Hence it is not possible to raise it. Therefore to push up the level of effective demand and thereby the level of employment and National income the only alternative is to raise the level of investment expenditure . Hence in the determination of the level of employment and national income investment expenditure plays vital role.

19.7.5 The Paradox of Poverty in the Midst of Plenty

In a poor country the propensity to consume will be high. Whatever is produced will soon be consumed. The market will more or less be a sellers market. But this is not the case with a wealthy country. As income rise the propensity to consume decreases and consequently the consumption expenditure will be much behind the production. The gap between production and consumption could be bridged, as mentioned earlier by raising the investment expenditure . But investment expenditure depends on marginal efficiency of capital , which in turn depends on psychological factors. So investment expenditure may not be so easily forthcoming to fill the gap. Consequently the aggregate demand declines forcing down the effective demand. Declining effective demand will lead to lay-offs and retrenchments. As the level of employment goes down, the purchasing power of the people decreases and hence they cannot maintain their standard of living . There is no dearth of comodities and services in the market. The entrepreneurs will be anxious to dispose off their stocks. But the people will not be in a position to purchase them. Even though the economy is potentially wealthy, it will be forced to cutback its production, until it becomes so poor that the excess of output over consumption is disposed off. Thus the dificiency of purchasing power on one hand and the glut in the market on the other .... i . e., over - production and under - demand-keep the people poor, though the economy is rich. Hence as Keynes aptly remarked "The richer the community, the more obvious and outrageous the defects of the economic system that lead to unemployment on a mass scale in the midst of potential plenty because of dificiency of effective demand".

19.8 Emergence of Macro Economics

Even though macro-economics as such owes its birth to the publication of Keynes *'General Theory'*, its emergence has been traced in the classicals whose economics is nowadays called 'Magnificent Macro Dynamics'. The emergence of macro economics heralded a new branch of economics, distinct from micro economics, and economists have started to comprehend the various economic relations in their totality. The Keynesian economics had been mainly responsible for the revolution in the thinking on certain themes in economics. The main off shoot of this macro economics had been the growth theory and growth models which started a fresh ground for new theoretical approaches. The famous Harrod ... Domer model of economic growth, which has some practical relevance, had been exercising a great influence on building macro economic models. Testing of certain theories in macro economics is also made possible with the concurrent development of econmetrics and macro economic models are the order of the day. This model building and feeding of data for practical verification has brought a sea change in the subject to reality. The various debates on macro-economic themes like the Monetariest Version, Supply -side economics has also enriched the subject and to- day economists exert a great influence in Government policy evolution as well as policy implementation even in countries like the U.S.A., the U.K. and other European nations, apart from the Socialist nations.

19.9 Summing Up

The major emphasis given in this unit is on effective demand. It shows a particular level of employment at which aggregate demand equals aggregate supply. It consists of consumption expenditure, investment expenditure, government expednture and foreign trade. Effective demand is determined by aggregate demand price and aggregate supply price. The former is the amount which the entrepreneurs expect to receive and the latter is the amount which they must receive. Interaction

between these two forces decides effective demand. This equilibrium need not lead to full employment. Full employment can be achieved by shifting either of the two. But, in the view of Keynes, aggregate supply function cannot be shifted in the short run. So, aggregate demand function, a flexible factor, plays vital role in determining the effective demand and the level of full employment. this is the most important tool designed by Keynes in not only establishing the full employment level but also repudiating the views of classicals on employment equilibrium .

-Sri M. Ramachandra Rao

19.10 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. M.L. Seth : An Introduction to Keynesian Economics

19.11 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is meant by effective demand ? How is it determined ?
2. "The logical starting point of Keynes' theory of employment is the principle of effective demand" - discuss.
3. What is meant by full employment equilibrium ? Is it possible to attain profits at this equilibrium ?
4. Bring out the significance of the principle of effective demand .

II. Answer each of the following questions in about 15 lines.

1. What is aggregate demand function ?
2. What is aggregate supply function ?
3. What do you mean by the paradox of poverty in the midst of plenty ?
4. Explain the components of effective demand, in brief .

BLOCK - VII

INCOME DETERMINATION

This block tries to explain the concepts used by Keynes on theories of consumption, savings and investment such as consumption function, average and marginal propensities to consume, savings function, multiplier, accelerator, investment function, liquidity trap and liquidity preference. The determinants of consumption function, savings and investment function are discussed. The theory of 'marginal efficiency of capital' and liquidity preference are also examined in this block. We also learn the 'IS-LM' approach.

This block consists of the following 4 units :

Unit - 20 : Consumption Function
Unit - 21 : Investment and Savings
Unit - 22 : Investment Function and Rate of Interest
Unit - 23 : Integrating the Monetary and Physical Factors.

Unit - 20 : Consumption Function

Contents

20.0 Aims and Objectives

This unit explains various factors affecting the consumption component of the aggregate demand in the simple model of income determination.

After reading the unit, you will be able to

* interpret the meaning of consumption function ,
* categorize the components of consumption function,
* identify the factors affecting consumption function, and
* acquire the nature of consumption function.

20.1 Introduction

National income accounting measures economic activity that has taken place in a certain economy over a period of time, but these figures do not reveal why the numbers are, what they are. The main concern of the theory of income determination is to explain how the national income is determined and how it changes. As has been explained in the earlier units, the short-period equilibrium of the economy depends on the balance between aggregate demand and output. The most

enlightening way of looking at aggregate demand is to look at its components. When the international sector is excluded for simplicity, then :

Aggregate Demand = Consumption demand + Investment

Demand + Government demand.

For the sake of further simplicity let us assume that investment demand is given and Government demand cannot be determined until we know the other two components. This leaves us with the consumption demand.

20.2 Concept of Consumption Function

There is a close relationship between aggregate consumption demand and the level of disposable income. This relationship leads to one of the central prepositions of the theory of income determination. The consumption expenditure of the community is determined principally by the community's level of disposable income. The schedule that relates consumption to disposable income is called the *"propensity to consume" or "the consumption function"*.

Figure 20.1 shows the consumption function which depicts the alternative levels of real consumption at alternative levels of real disposable income. At zero levels of disposable income there is a positive consumption of 20. At 50 units of disposable income, the consumption is equal to the income. As the disposable income rises to 100, the level of consumption reaches 80. Symbolically the aggregate consumption may be written as C = C (Y), where C is the amount of consumption expenditure and Y is the disposable income. Assuming the relationship between C and Y as lineasr,

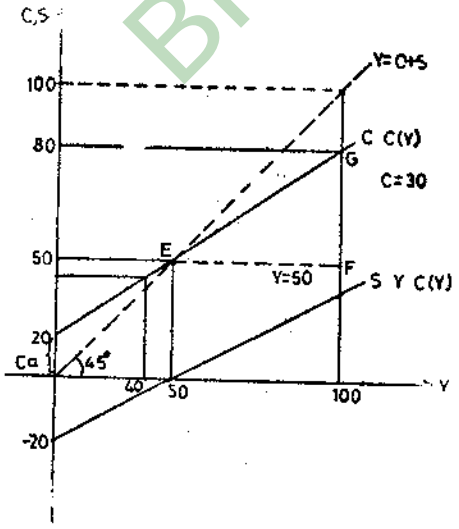


Fig.20.1 The Consumption and Saving Functions.

we may write explicitly . C=Ca+cY. Ca is the amount of consumption when income is zero. In the short run there is some minimum amount of consumption even where there is no income and this amount of consumption is called *autonomous consumption*, since it is independent of the level of income. C represents the extent of change in consumption with respect to a change in income. Keynes called it marginal propensity to consume (MPC). The consumption function shows that the

consumption expenditures vary directly with disposable income. It also shows how much of such expenditure will vary as disposable income varies. Keynes did this in his *"Fundamental Psychological Law"* which states that "men are disposed,as a rule and on the average, to increase their consumption as their income increases, but not by as much as the increase in their income". This becomes evident in the technical attributes of consumption function viz., the average and marginal propensities to consume.

20.3 Components of Consumption Function

20.3.1 Average Propensity to Consume

The average propensity to consume (APC) shows the fraction of total income spent on consumption. It is defined by the ratio of consumption to income or C/Y for different levels of income. In the above figure, at the level of disposable income (Y) of 40, the consumption (C) is 45, so that the APC is C/Y= 45/40 = 1.12. At the level of income of 50, the APC is C/Y = 50/50 = I and at the level of income of 100, the APC is 80/100=0.8. Thus the APC shows that the ratio of C to Y decreases steadily as income increases and vice versa. The average propensity to consume is a significant concept. It tells us what proportion of the total cost of a given level of the real income may be recovered from sales of consumption goods alone.

20.3.2 Marginal Propensity to Consume (MPC)

Marginal propensity to consume relates a change in consumption (ΔC), to a change in income (ΔY) that causes it. Symbolically, MPC = $\Delta C/\Delta Y$. The marginal propensity to consume is equal to the slope of the consumption function. For example, if income increases from 50 to 100, as shown in figure 23.1 consumption increases from 50 to 80. The MPC can be expressed by the ratio, $\Delta C/\Delta y$=30/50=GF/EF which is equal to the slope of the function. The assumption underlying the figure is that marginal propensity to consume is positive and less than one but greater than zero. MPC is important because it throws light on the possible division of any change in income between consumption and saving.

The average propensity to consume is greater than the marginal propensity to consume and as income increases the average propensity to consume decreases and the marginal propensity to consume remains constant.

Check your Progress - 1

1. *What is propensity to consume?*
2. *Define average propensity to consume.*
3. *What is MPC ? Explain the concept.*

20.4 Factors Affecting Consumption Function

20.4.A1 Absolute Income Hypothesis

The linear consumption function so far discussed is short run consumption function and it is

known as absolute income hypothesis. As a starting point, it is reasonable to assume that consumption function depends upon disposable income.

Still it is too simple and conceals many other determinants of consumption like the relative income, permanent income, price level, interest rate, and income distribution. Let us discuss about them.

20.4.A2 Relative Income Hypothesis

Let us briefly review the factors other than disposable income that affect consumption. The other fact affecting consumption came to limelight when it was observed by a pioneering study undertaken by Kuznets that APC was equal to MPC in the long run. While APC was greater than MPC in the short run. Certain hypotheses had been advanced to reconcile these two apparently contradicting phenomena in the consumption function. According to *relative income hypothesis*, which is closely associated with the name of James. S. Duesenberry, the proportion of family income devoted to consumption depends upon the level of its income relative to the income of neighbouring families and not on the absolute level of family income. Thus, if a family's income rises but its relative position on the income scale remains unchanged because the incomes of the other families have risen at the same rate, its division of income between consumption and saving remains unchanged.

20.4.A3 Permanent Income Hypothesis

Milton Friedman disagrees with both the absolute income and relative income hypotheses which constitute "current" income and replaces it with *"permanent" income hypothesis* . The 'measured income' received consists of two components viz, 'permanent income' and 'transitory income'. Permanent income may be defined as that amount of income that can be consumed without affecting the wealth. It is to be regarded as the mean income considered to be permanent by the consumer unit depending on its horizon and farsightedness. Similarly the measured consumption also has two components: permanent consumption and transitory consumption. Consumption in the present period depends upon the permanent income and the transitory income does not influence it. For some groups of families the average of all transitory incomes equals zero. For lower-income families, there will be a higher proportion that will be experiencing negative transitory incomes than will be getting temporary increases. Yet these families continue to consume on the basis of permanent incomes. For higher income families, temporary windfalls boost the money incomes above the permanent levels. In this case, more families are receiving temporary gains than are experiencing losses. These families also base their consumption patterns on permanent incomes and therefore, all the temporary income will be saved. Here the APC of money income falls, but again, the APC of permanent income remains constant. Similarly the life cycle hypothesis as propounded by Modigliani & others suggest that consumption in the present period is influenced by the level of resources, which refers to the total value of resources expected by the household to be available for consumption over its entire life cycle. This hypothesis is more of a permanent wealth hypothesis than a permanent income hypothesis. However, it may be noted that the various arguments of the permanent income theory have raised considerable controversy and generated a sizeable literature.

20.4.B1 Price Level

The consumption function as shown in the figure above is in terms of real income and consumption, and not in terms of money values which may alter solely because of price changes. If prices and incomes change proportionately, real income remains constant and presumably there should be no effect on consumption. But in reality, price changes affect consumption in various ways.

First, a change in the general price level is unlikely to involve an equal and proportionate change in the price of each single commodity. For example, if food prices rise by 5% while clothing price rises by 15% then consumers may buy the same quantity of food but less of clothing. This results in a fall in real consumption. Secondly, a change in national income does not necessarily mean an equal change in personal disposable incomes, when prices rise the profits of the firms go up but if the profits are retained by companies or subjected to progressive taxation, the disposable income will rise at a lesser percentage than the rise in national income. Thirdly, changes in the general price-level will give rise to what has been called the *'Pigou effect'* or *'wealth effect'* or *'real balance-effect'*. Individuals who possess money balances will feel worse off when prices rise and better off when prices fall, because of the change in the real value of their money. Finally, changes in the price level may set up expectations of further movements in the same directions. A fall in prices may lead consumers to expect further reduction and to postpone some consumption in the hope of getting more for their money later on. Conversely , the expectation of rising prices may cause consumption to increase. These expectation effects of price-changes work in the opposite direction to the "Pigou effect", and will tend to neutralize it.

20.4.B2 Rate of Interest

Prior to Keynes rate of interest was considered to be one of the main determinants of the division of income between consumption and savings. A rise in interest rates makes lending more remmunerative and therefore more inducement to save, leading the consumption function to shift downwards. Conversely, a fall in interest rates will reduce the attractiveness of saving, and the consumption function will move upwards. This pre-Keynesian notion is no longer widely held. Some people may save more when the interest rate increases. There are others who might save less as interest rises, since they might have some specific goal in mind and the higher interest rate means higher income. Thus there would be no need to save as much to reach the goal. In the aggregate, as the rate of interest increases, the people who save more may be balanced by those who save less. On the whole, the influence of interest rate changes on the consumption function is unlikely to be very marked.

20.4.B3 Income distribution

With any given level of disposable income, the level of consumption expenditures resulting therefrom tends to be larger or smaller, depending on the distribution of that income by income class. In general, the more equal that distribution is, the larger the fraction devoted to consumption. Any change in the distribution of income against higher-income families and in favour of lower-income families may mean an increase in consumption, but subject to a number of qualifications that may limit the quantitative importance of such changes.

20.5 Nature of Consumption Function

The above analysis of consumption function shows that though disposable income is, if not the sole determinant of consumer's demand, at least the most important of the many factors which can be held to influence it. Thus, by nature, consumption function shows a relationship in terms of real income and real consumption.. The consumption function may take the form of either $C = a + by$ or $C = by$ or $C = a + b\sqrt{y-a}$. The first refers to the linear function with a certain minimum positive consumption at zero level of income. The second form refers to a situation where there is no consumption at zero income and the third refers to a non-linear consumption function, which shows that at higher levels of income, consumption rises as income rises, but by less than the increase in

income. The linear consumption function serves as a starting point in most of the simple models of income determination.

Check Your Progress - 2

4. *What is relative income hypothesis?*

5. *Explain the permanent income hypothesis.*

6. *What are the factors which affect consumption?*

7. *Give symbolic form of linear consumption function.*

20.6 Summing Up

Consumption is one of the components of effective demand. Consumption function explains the relationship between consumption and disposable income. APC and MPC are the components of consumption function. Absolute, relative and permanent income hypotheses are the major determinants of consumption function. Price level, rate of interest, income distribution, etc. are the other factors which affect consumption function. It can be shown in linear form or in non-linear form. Consumption function is a useful part in income determination theories.

- Prof. D. Narasimha Reddy

20.7 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. M.L.Seth : An Introduction to Keynesian Economics

20.8 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the behaviour of average and marginal propensities to consume as income increases.
2. What is consumption function? What are the factors affecting consumption function?
3. Explain the three income hypotheses which affect consumption function.

II. Answer each of the following questions in about 15 lines.

1. Explain average and marginal propensities to consume.
2. Illustrate diagrammatically the consumption function.
3. Explain the permanent income hypothesis.
4. Discuss the relative and absolute income hypotheses.
5. What is fundamental psychological law of Keynes ?

Unit-21 : Investment and Savings

Contents

21.0 Aims and Objectives

The purpose of this unit is to introduce the concepts of investment, savings, multiplier and accelerator. It also explains marginal efficiency of capital which is one of the determinants of investment.

After reading this unit, you will be able to

* Explain the operational mechanism of investment,
* describe the multiplier, accelerator, and super multiplier,
* introduce the concepts of savings and savings functions,
* distinguish the relationship between savings and investment, and
* explain marginal efficiency of capital.

21.1 Introduction

Equilibrium income depends on effective demand. The latter depends on aggregaste demand in short run. Aggregate demand depends on consumption function and investment function. You have learnt about concumption function in the last unit.

Investment depends on autonomous factors like government expenditure on the one hand and induced factors on the other. How this investment operates will be stidied in the following part of the unit.

21.2 Operation Mechanism of Investment

In Keynsian theory, investment has important role to play , as consumption cannot increase at the rate at which income increases. To close the gap between consumtion function and the level of effective demand, investment is very much needed. Given the consumption function, increased investment increases the effective demand and thereby the level of employment and income.

Suppose the businessmen increase investment due to animal spirit, then the aggregate demand curve shifts upwards (see diagram 21.1)

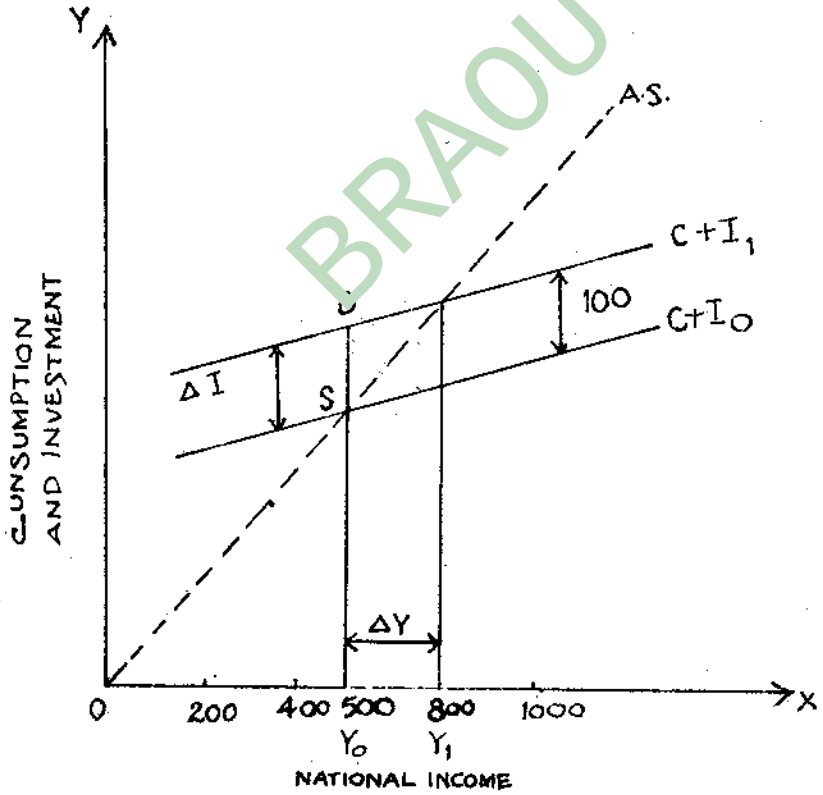


Fig. - 21.1 : Aggregate Demand and Aggregate Supply Curve

A.S. = Aggregate Supply curve

I = Additional Investment

$C+I_1$ = New aggregate demand curve

$C+I_1$ = Old aggregate demand curve or line.

In the diagram, old aggregate demand curve is $C+I_0$. After increase in investment , aggregate demand curve is $C+I_1$. Increase in investment is shown as I which is equal to "DS". This is the difference between parallel lines $C+I_1$ and $C+I_0$.

Assume Rs. 100 as increase in investment. Due to this additional investment at Y_0 (old level of income of Rs. 500) aggregate demand is greater than aggregate supply. This gap 'DS' is called inclationary gap. Due to inflationary gap, prices will tend to rise. To keep prices constant, income level has to increase from Y_0 to Y_1 that is from Rs. 500 to Rs. 800.

Increase in income is possible through increase in employment and output, given the prices. This increase in income depends on the change in level of investment, and on the coefficient showing relationship between marginal income and investment. According to psychological law of consumption, consumption cannot rise as fast as income. Then the alternative is to increase investment to bridge the guif. Otherwise income level will decrease due to less aggregate demand and possible fall in rate of profit. So investment is crucial to overcome the problem of under-employment.

Check Your Progress - 1

1. *Explain whether rise in investment increases income.*

21.3 Multiplier and Accelerator

21.3.1 Multiplier

The multiplier shows the relationship between marginal income and additional investment. In diagram 21.1, we could see that an increase of Rs. 100 in investment lead to a change of Rs. 300 in income. Income has changed by 3 times to additional investment, in other words it is 3 multiples of I. Here multiplier is 3. Multiplier's lower limit is one (1), upper limit is infinite (α). The ratio between additional income and additional investment is called investment multiplier.

$$K_0 = \text{Investment Multiplier} = \frac{\Delta Y}{\Delta I} = \frac{\text{change in income}}{\text{change in investment}}$$

If change in income is Rs. 500 due to change in investment of say Rs. 250, then

$$\text{Multiplier} = \frac{500}{250} = 2.$$

The size of multiplier depends on marginal propensity to consume (MPC), availability of goods, time gap between income and expenditure and nature of investment, etc. The higher the marginal propensity to consume (MPC), the higher will be the multiplier and vice versa. Any investment made in the first round creates income equal to it. In the next round, creation of income depends on the amount spent on consumption out of the increased income. Multiplier can be worked out as follows.

$$K_0 = \text{Multiplier} = \frac{1}{1-MPC} = \frac{1}{MPS}$$

MPC, MPS are marginal propensity to consume and save, respectively.

If MPC = 0.5 then $K_o = \frac{1}{1 - 0.5} = \frac{1}{0.5} = 1 \div 5/10 = 10/5 = 2.$

If MPC = 0.8 then $K_o = \frac{1}{1 - 0.8} = \frac{1}{0.2} = 1x10/2 = 5.$

Keynes' multiplier is criticised because it is the static concept, and it ignores the effect of income on investment. Gordon says multiplier depends on marginal propensity to spend, not on MPC.

Increase in income depends on increase in investment and size of multiplier ($\Delta Y = \Delta I..K_0$).

R.F. Khan, earlier than Keynes, used employment multiplier as a ratio between overall rise in employment and primary employment.

Check Your Progress - 2

2. *What is multiplier?*

3. *Explain the relationship between MPC and multiplier.*

21.3.2 Accelerator

J.M. Clark introduced this concept. Any increase in income or demand requires a matching supply of goods. To supply goods or to produce goods, new investment is needed, provided there is no unutilised capacity. Additional investment caused by additional income is called *accelerator*. The accelerator is a ratio between I and Y. In other words,it is marginal or incremental capital-output ratio. Accelerator depends on techological factors where as multiplier relies on psychological factors. Accelerator is an increase in induced investment caused by an increase in aggregate income.

Assume the increase of Rs. 200 in income. To produce necessary investment goods to satisfy increased demand of income, some additional investment is made, say Rs. 600. In this case, accelerator is $\Delta I/\Delta Y = 600/200 = 3$. Here we should note that the same Rs. 600 will continue to produce output in later years also.

If depreciation is positive, gross investment will be more than net investment and accelerator will be higher. Accelerator is the factor which gives cumulative effect to the economy. The trade cycle theory of Hicks, dynamic theory of Harrod are based on accelerator theory.

Limitations of Accelerator :

1. It operates only in the situation of full capacity utilisation. If increased demand for consumption goods is satisfied by using earlier machinery's unutilised capacity, no new investment is needed.

2. Accelerator assumes constant output-capital ratio (same as K/o constancy), which is not true under dynamic conditions.

Check Your Progress - 3

4. *What is accelerator?*

5. *What are the limitations of accelerator?*

21.3.3 Super Multiplier (Interaction of Multiplier and Accelerator)

J.K. Hicks introduced super multiplier to analyse trade cycles.

The effect of initial investment on income depends on both multiplier and accelerator. Suppose autonomous investment is Rs. 100, multiplier 2, then income increasesby Rs. 200. With a K/0 of 3/1, to produce Rs. 200 worth of goods, Rs. 600 of additional investment becomes necessary. Once again this new investment of Rs. 600 creates income through multiplier. This type of interaction between multiplier and accelerator gives cummulative movement to the economy. As the rate of growth of consumption slows down, rate of investment decreases. Simultaniously income and business start falling leading to a downward movement of trade cycles.

Keynesian multiplier shows relationship between ΔY and ΔI in the absence of acceleration principle. Supper multiplier is a result of both multiplier and accelerator effects.

$$\text{Super multiplier} = \frac{\Delta Y_{m+a}}{\Delta I} = \frac{1}{1 - MPC - MPI}$$

where, ΔY_{m+a} = Increase in income due to multiplier and accelerator effect,

ΔI = Additional investment,

MPC = Marginal Propensity to Consume = $\Delta C/\Delta Y$,

and MPI = Marginal Propensity to Invest = $\Delta I/\Delta Y$.

For example, MPC = 0.5, MPI = 0.3, then

Super multiplier will be $\frac{1}{1-0.5-0.3} = \frac{1}{0.2} = 5$.

It means every unit of additional investment after a chain of interactions produces five units of additional output.

Super multiplier explains the reasons for change in the direction of trade cycles. Given the super multiplier, changes in income depend on marginal efficiency of capital, rate of interest, and savings, etc.

Check Your Progress - 4

6. What is super multiplier?

21.4 Savings and Savings Function

21.4.1 Concept of Savings

Savings is the excess of income over consumption expenditure. These savings consist of house- hold, corporate and government savings.

$S = Y - C$

Where, S = Savings, Y = Income, and C = Consumption.

$$\text{Average Propensity to Save} = APS = \frac{\text{Total Savings}}{\text{Total Income}} = \frac{S}{Y}$$

$$\text{Marginal Propensity to Save} = MPS = \frac{\text{Additional Savings}}{\text{Additional Income}} = \frac{\Delta S}{\Delta Y}$$

Table - 1 : Income, Consumption and Savings (Figures in Rupees)

Income (Y)	Consumption (C)	Marginal Savings(S)	Marginal Comsumption	Marginal Savings	Income
100	80	20	-	-	-
200	140	60 (140-80)	60 (60-20)	40 (200-100)	100

At Rs. 200 income, APS =60 / 200 = 30%

At Rs. 200 income, MPS =40 / 100 = 40%

As income increases, savings, APS and MPS will increase. At zero level of income savings will be negative.

21.4.2 Savings Function

Savings function tells about the factors on which savings depend. Savings depend on the level of income, type of income , income distribution, tastes, rate of interest, investment, etc. These are called determinants of savings.

S = Autonomous Savings + MPS(Y). In this savings function, autonomous savings tells about the level of savings at zero level income, ceteris paribus. Given the autonomous savings, change in the savings depends on Income and MPS.

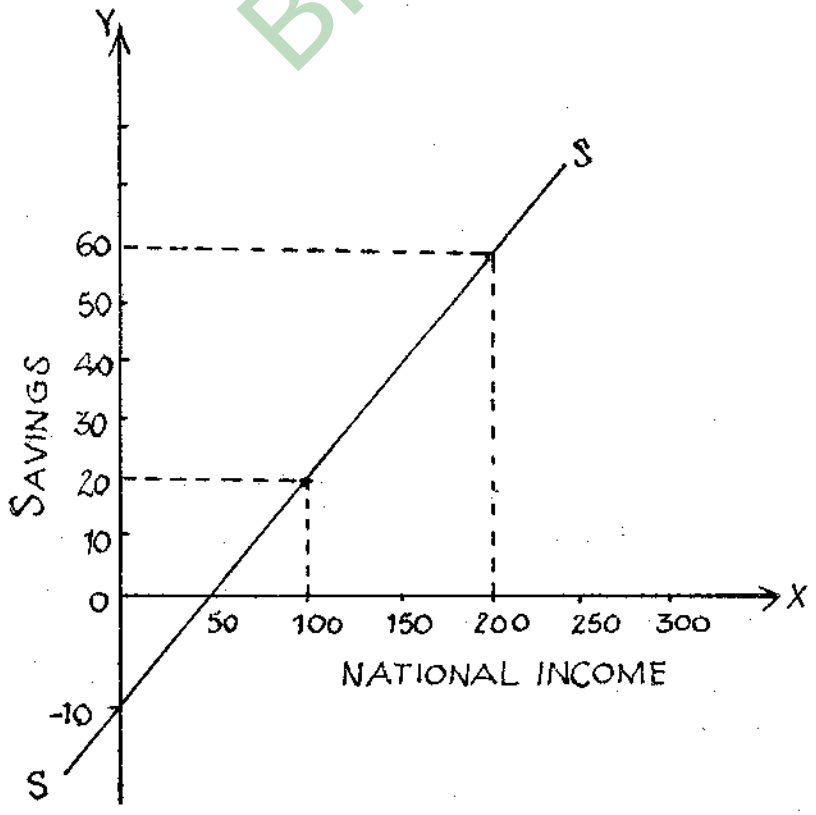


Fig- 21.2 : Savings Function

In diagram 21.2, the SS line shows savings function. As income increases (from 50 to 200) savings also increases (from 20 to 60) and vice versa. Slope of the savings function is marginal propensity to save.

Check Your Progress - 5

7. *Explain the concept of savings.*

8. *What are the determinants of savings?*

21.5 Relationship between Savings and Investment

Earlier, classical economists thought that savings (S) will be always equal to investment. But Keynes demonstrated that savings decisions are different from investment decisions. Savings consists of the amount spent on investment and unspent savings. So investment is different from savings.

After changes in income (due to investment), realised or actual savings always equal actual investment. It is called *expost* equality of investment and savings.

Exante, expected, anticipated or desired investment are all used here as synonyms. If in an economy, investors want to invest more than savings that are available, we say that, exante investment is greater than exante savings. Under these circumstances, aggregate demand increases and expected profits (and expected rate of profit) also increase. This induces further investment and in turn incomes increase. As savings is a function of income, savings also increase to the extent of investment. Such equality between investment and savings is called expost equality of investment and savings.

21.5.1 Thrift Paradox

Ricardo, J.B. Say, Pigou and Marshall believed that increase in savings automatically increases investment to its level. But Keynes did not agree with them and explained that increase in savings need not necessarily increase investment or income. He adds that increase in savings decreases aggregate demand (as consumption gets reduced further), as a result prices and profitability, investment and incomes will decrease. Such decrease in income decreases savings further. So increase in savings is suicidal to savings (it is not good to save at macro level especially in developed countries, facing depression). It is opposite to what we expect about savings, that is why, it is a paradox.

To increase levels of income and to create a congenial atmosphere to investors, it is not the savings but the investment that has to be increased.

Given the investment, increase in savings decreases the level of income and vice cersa as shown in diagram 21.3.

At Rs. 1000/- income level, investment and savings are equal at E. If savings increase due to some reason at the same level of income, savings become 'BA'. This is greater than investment, that is 'BE'. As a result of increase in savings, aggregate demand decreases and incomes will decrease. Lower consumption (but with old investment, say Rs. 200) and investment push back effective demand to reach B_1 level (i.e. Rs. 800). New equilibrium income will settle at B_1 i.e. Rs. 800, as S_1 and I are equal at E_1.

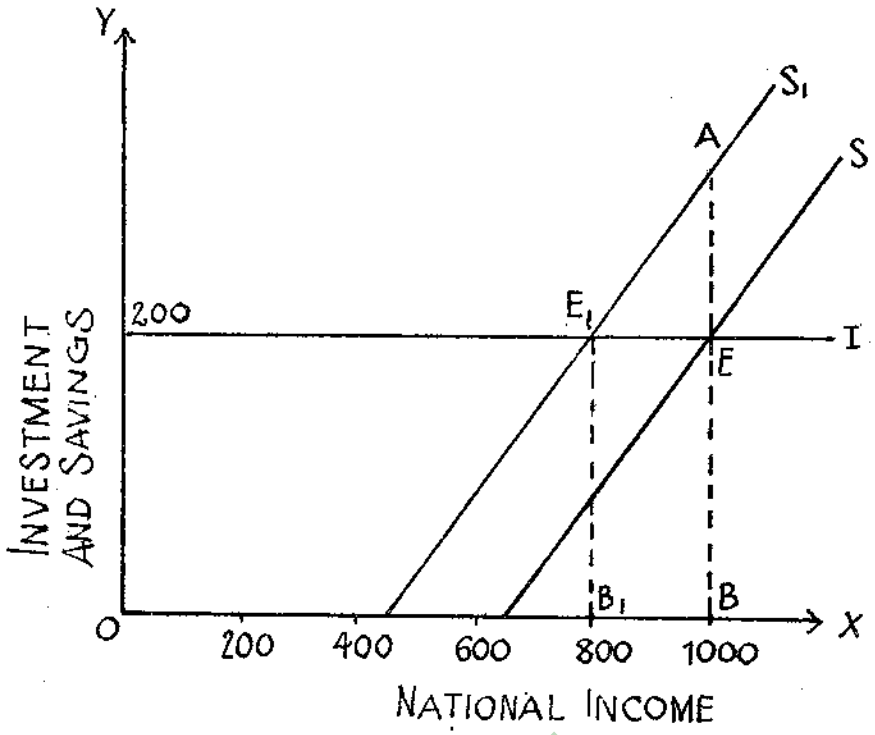


Fig. 21.3 : Thrift Paradox

21.5.2 Investment and Savings Equality

J.M. Keynes says that increase in investment increases savings through increase in income. So it is investment that determines savings, not vice versa. Given the savings function, increase in level of investment increases level of income as shown in diagram 21.4.

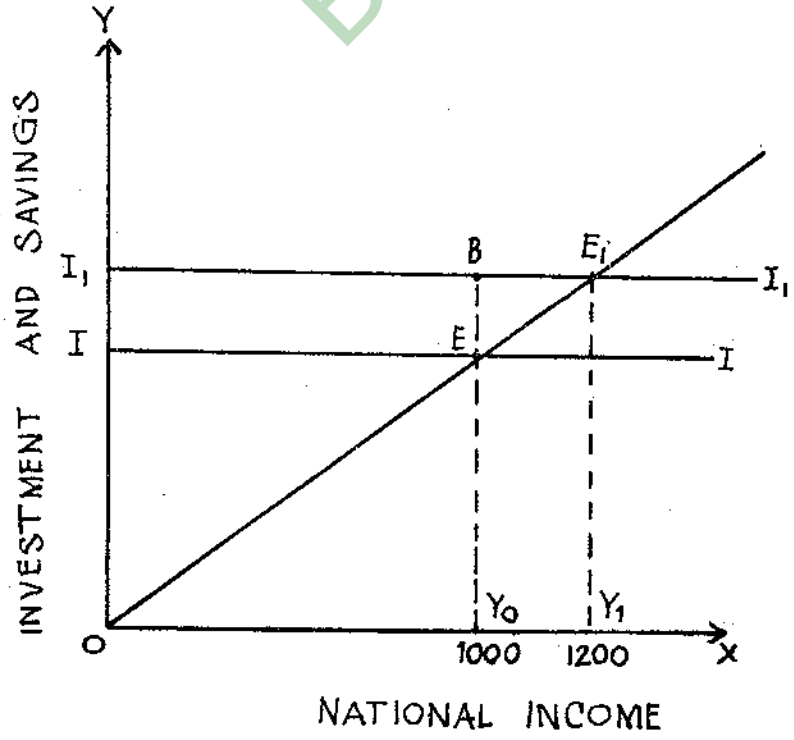


Fig. - 21.4 : Investment and Savings Equility

If anticipated or exante investment is greater than savings (I > S) income increases. When I = S, income will be in equilibrium with no tendency to change. If exante I < S (exante I is less than S), income level will contract. At income Rs. 1000, I_1, (YoB) is greater than savings (YoE). This increases income from 1000 to 1200.

$I \gtreqless S$ determines income changes.

Table - 2 : Changes in Income, Savings and Investment (Figures in Rupees)

Round	Y	C	S	I	Total Demand
1st	100	80	20	120	200
2nd	200	80	120	120	200
3rd	200	80	120	70	150
4th	150	80	70	70	150

Table 2 is an illustration with no change in consumption. Suppose in first round exante investment is 120 and exante savings is 20, then total demand (C+I) becomes 80 + 120 = 200. This demand increases income to Rs. 200 level from Rs. 100. In second round if exante investment and savings are same at Rs. 120, income will not change and remains at Rs. 200 only. Suppose exante investment is 70 against savings of 120, as shown in 3rd round, then aggregate demand becomes Rs. 150 (as C+I = 80+70). As I <S,incomes decrease. As income decreases, savings also decrease to the level of investment. Hence we can emphasize that investment changes savings through changes in income (Y). The cause is investment and the effect is on savings, not vice versa in Keynesian theory. He says increase in savings need not increase investment and income. But increase in investment increases income and savings. Keynes further shows that equality (expost equality) between investment and savings is due to changes in income,but not due to changes in rates of interest.

Check Your Progress - 6

9. *Explain the views of classicals on savings and investment equality.*

10. *What does Keynes say on the equality between savings and investment?*

21.6 Marginal Efficiency of Capital (MEC)

21.6.1 The Theory

In Keynsian theory, marginal efficiency of capital (MEC) is an important determinant of investment. Marginal efficiency of capital tells about the efficiency of marginal capital. Marginal capital is additional investment. The return that it earns reflects efficiency. So marginal efficiecny of capital is the expected rate of profit on the marginal capital or investment. Marginal efficiency of capital is the rate of discount that equates the stream of expected income and the cost of project (when there are no price changes).

Suppose we additionally make an investment of Rs. 100 and we expect Rs. 121 return only at the end of 2 years. If our expeectations are rational and certain, the rate of return we get is 10% which is as follows.

'r' is the rate of discount or expected rate of profit.

$$121 = 100\,(1+r)^2 \quad \text{or} \quad 100 = \frac{121}{(1+r)^2}$$

$$100\,(1+r)^2 = 121$$

$$(1+r)^2 = \frac{121}{100}$$

$$(1+r)^2 = \frac{11}{10} \times \frac{11}{10}$$

$$(1+r) = \sqrt{\frac{11}{10} \times \frac{11}{10}}$$

$$r = \frac{11}{10} - 1 = \frac{11-10}{10} = \frac{1}{10} = 10\%.$$

MEC or expected rate of profit is 10%. At present if in the market, prevailing rate of interest is more than 10%, say 15%, no one will invest the money on the project yielding 10% rate of return only. On the other hand, if expected rate of profit is more than prevailing market rate of interest, the new investment will be undertaken by entrepreneurs. New or additional investment takes place as long as marginal efficiency of capital is more than rate of interest.

We can interpret the above example in another way. Rs. 121 expected income discounted at the rate of 10% becomes Rs. 100 of present value (this difference of 21 is due to rate of interest, not price changes). Suppose a business man has to spend Rs. 110, at present, to earn 121 after 2 years. If the market rate of interest is 10%, he would not like to invest, because his present investment is 110, where as the present value of expected income is only Rs. 100.

Generally, projects on which we invest gives us a flow of annuities (annnual incomes) over a period of time. In such cases we calculate marginal efficiency of capital on the basis of following formulae.

$$C = \frac{R_1}{(1+r)} + \frac{R_2}{(1+r)^2} + \ldots\ldots + \frac{R_n}{(1+r)^n}$$

C = cost of capital gods = costs incurred on machines, etc.

R1, R2,.....,Rn = expected net future returns at the end of years 1,2, ...,n respectively.

r = rate of discount equating cost of capital goods and future returns i.e ., marginal efficiency of capital.

For example, take C as Rs. 421. If the project gives return only for 5 years at the rate of Rs. 100 every year, the MEC becomes 6% (scrape value of machinery is zero at the end of 5 years).

$$C = \frac{100}{(1+r)} + \frac{100}{(1+r)^2} + \frac{100}{(1+r)^3} + \frac{100}{(1+r)^4} + \frac{100}{(1+r)^5}$$

In the country, if market rate of interest (i) is more than 6%, the investment on the above shown project will not be made. If r>i (if marginal efficiency of capital is more than rate of interest), investment will increase. If r<i, investment will be curtailed.

Another way to know MEC is to compare the discounted future income at market rate of interest (i.e., discounted present value) with the cost of capital goods or machine.

$$V = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \ldots\ldots + \frac{R_n}{(1+i)^n}$$

V = Present value of income got by discounting future incomes at market rate of interest (i.e., i)

When market rate of interest is 6% as shown earlier and if project 'B' gives discounted present value of Rs. 421.... whether we can take up project 'B' or not depends on cost price (supply price) of the project. If supply price or cost of machine is less than Rs. 421, project 'B' becomes profitable and will be undertaken. If cost price is more than V i.e., discounted present value (at prevailing market rate of interest), no investment will be made on project 'B'. Caution is, we assumed no change in the rate of interest over gestation period and there are no price changes.

21.6.2 Factors Determining Marginal Efficiency of Capital

The MEC is based on expected rate of return on costs and investment. Expectations about the future are based on past experience and present conditions. In this dynamic world, businessmen produce goods on the basis of expected demand. These expectations are influential variables in determining investment decisions.

Increase in cost of capital or increase in rate of interest or fall in the expected level of output or all of them partly or together decrease MEC. The factors like cultural, institutional forces, expected returns, technological changes, innovations, growth of population, tax policies, wages, etc. influence marginal efficiency of capital. Given the rate of return on a project ,whether a project will be undertaken or not depend on rate of interest. As rate of interest falls, projects of lower yield also will be considered for investment.

21.6.3 Marginal Efficiency of Capital Schedule

Marginal efficiency of capital schedule for firms will be based on ranking of the projects depending on the rate of returns on one hand and rate of interest on the other. MEC schedule for the economy is the aggregation of all firms' MEC schedules. Demand curve for capital goods depends on the MEC schedule of the economy. MEC curve (based on schedule) slopes downward to the right. As size of investment increases, MEC decreases and vice versa (as shown in the diagram 21.5).

As investment increases demand fo r inputs rises and costs of production increases. Cost rise may also be due to diseconomies of scale of production and increase in rate of interest caused by the increased demand for capital .On the other hand as output increases, price of the product may get reduced (due to negative slope of demand curve) and expected returns may decrease.

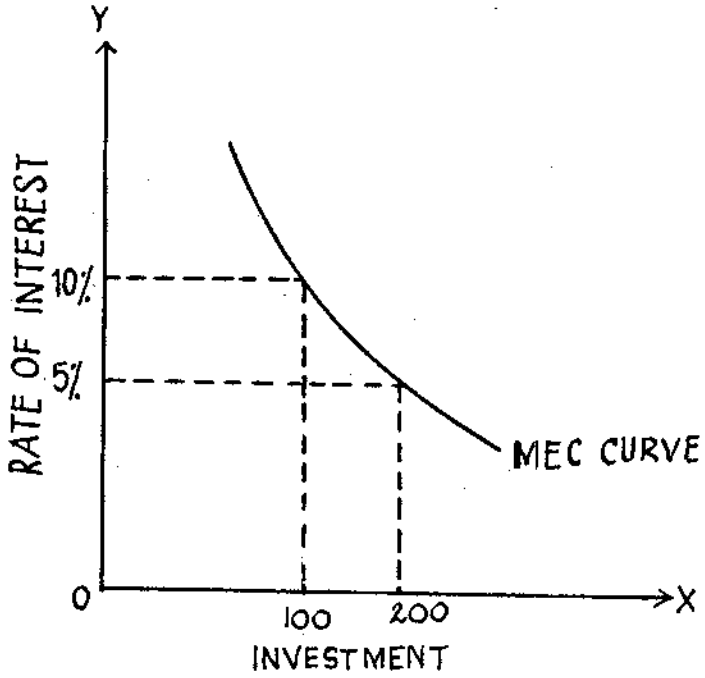


Fig. 21.5 - MEC Curve

Diagram 21.6 shows that if rate of interest falls to 6% , all the projects yielding more than 6% MEC will be undertaken for investment and investment made will be Rs. 200 .

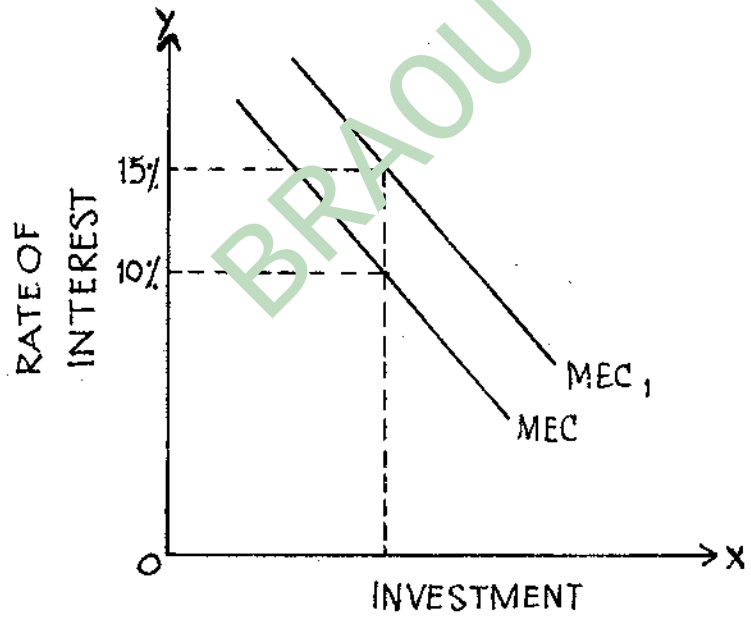


Fig. - 21.6 : Marginal Efficiency of Capital

The degree of response of investment due to change in rate of interest shows *interest elasticity of investment demand*. It is the percentage change in investment divided by the percentage change in rate of interest. If the investment is less interest-elastic, some other factors are supposed to have greater effect on investment. Slope of the MEC line indicates interest elasticity. Innovations increase the demand for capital goods and it pushes MEC curve to the right (see diagram 21.6). The investment offering higher MEC may be due to capital saving methods or technical progress.

Keynes emphasized the role of MEC in determining investment. Given a rate of interest, higher MEC means greater investment. Enterpreneurs' investment decision depends on MEC, but not on rate of interest. Even under the conditions of rising rate of interest, investment may increase due to relatively higher MEC. Investment continues to swell until marginal efficiency of capital is equal to rate of interest.

Check Your Progress - 7

11. *What is MEC?*

12. *List the factors which determine MEC?*

13. *What is the slope of MEC Curve?*

21.7 Summing Up

Investment plays an important role in Keynesian theory. It increases equilibrium level of income through multiplier, accelerator and their interaction. Such investment does not depend on savings. It is the investment which determines savings and not vice versa. Equality between investment and savings gives equilibrium level of output. Marginal efficiency of capital or the expected rate of profit is crucial in determining investment.

- Prof. D.Narasimha Reddy &
Sri. G.V. Ranga Rao

21.8 Suggested Books

1. Ackley, Gardner : Macro Economic Theory
2. Stonier and Hague : A Text Book of Economic Theory
3. Edgmand, M. : Macro Economics
4. Hansen, A. : A Guide to Keynes
5. Shapiro, E. : Macro Economic Analysis

21.9 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is the role of investment in Keynesian theory?
2. Explain the processes of multiplier, accelerator and the interaction between them.
3. Explain marginal efficiency of capital.

II. Answer each of the following questions in about 15 lines.

1. What is multiplier?
2. What is accelerator?
3. Explain the interaction between multiplier and accelerator.
4. Discuss the equality between investment and savings.
5. What is thrift paradox?
6. Explain the MEC schedule.

Unit - 22 : Investment Function and Rate of Interest

Contents

22.0 Aims and Objectives

The aim of this unit is to describe the concepts pertaining to investment and explain the factors on which investment depends.

After reading the unit, you will be able to:

* analyse the concepts of investment, investment demand and its function,
* derive the investment function,
* list out the determinants of investment demand,

* recognize the determinants of demand for money, and
* explain the liquidity preference theory.

22.1 Intorduction

National income is nothing but consumption and savings. Savings may or may not be invested. Investment occupies important place in determining growth and equilibrium.

Induced investment depends on the investment function. Such investment function, in the short run, depends on income, savings, expected profits, rate of interest and realised profits, etc. Keynes suggests autonomous investment as an adhoc measure. He prefers to leave the determination of income to the factors like induced investment. How this investment gets influenced will be studied in the following part of the unit.

22.2 Investment and Investment Function

22.2.1 Concept of Investment

Investment, as defined by Edward Shapiro, is the value of that part pf the economy's output for any time period that takes the form of new structures, new producers' durable equipment and change in inventories.

Amount spent for new machinery or to create new employment is called *investment*. Investment in Keynes' view is real investment but not financial investment. Real investment is that which creates new employment facilities, new output or structure or equipment. New shares purchased add to the stock of capital, hence it is real investment. Old shares purchased, are simply a transfer of asset. It adds nothing to production or capital. Such financial investments are not investment according to Keynes.

By deducting depreciation from gross investment, we get investment. Depreciation is the allowance made to replace the worn out machinery and plant. Net investment is an addition to the stock of capital. Investment is a flow variable, capital is stock.

22.2.2 Importance of Investment

Investment is an important active variable in determining level of employment and income. To increase aggregate demand, either consumption or investment has to be increased in a closed economy. Consumption depends on income and is a passive variable, then the alternative is to increase investment. If mariginal efficiency of capital (MEC) is low, enterpreneurs will not be prepared to invest. Unless aggregate demand increases investment decisions will not be revised. Under such conditions of lower induced demand for investment, the autonomous investment is required. Such autonomous expenditure will be independent of MEC and rate of interest. This exogenous investment is possible through government expenditure.

Due to investment made by government, employment, income, and aggregate demand will increase. Then automatically induced investment will gain momentum. Increased employment and incomes due to investment generate demand, and new capital stock also will be formed with increase in investment. Keynes suggests even digging of holes and filling them up for creation of employment when we find no channels to invest.

22.2.3 Investment Demand

Demand for additional capital is called investment demand. Demand for investment depends on autonomous and induced investment. Induced investment demand depends on MEC, rate of interest, level of income, technological change, etc. It is endogenous. Autonomous investment is exogenous. Government spends by keeping income and fiscal policies in mind. Government expenditure on construction of canals, roads, electricity, etc. is called autonomous investment.

22.2.4 Investment Function

Keynes showed the way to protect capitalism when Marx predicted the fall of capitalism. Keynes suggested the temporary intervention of the government to keep the economy on right track. Once induced investment takes care of the economy, further autonomous investment has to be stopped. It is called *pump-priming theory.*

Investment function mainly tells about the induced investment . The explanation of the factors determining investment is called investment function. Some of the theories explaining investment function are as follows. The *accelerator theory of investment* shows that investment depends on changes in income. *Internal fund theory of investment* explains that investment depends on level of profits. Tinbergen felt that realised profits accurately reflected expected profits. So internal fund theory says that investment is determined by profits. *Neo classical theory* explains that investment depends on rate of interest. *Classicals* believe that savings determine investment. Jorgenson, Hunter, Nadiri show that neo-classical theory is better than accelerator theory.

To say simply, investment is a function of marginal efficiency of capital, rate of interest and changes in income, given the technology. Investment function not only tells about the factor influencing investment, but also quantifies their relationship between the variables, and enable us to understand the causal relation.

Generally, there is a positive relation between national income (Y) and profits. Higher level of income is associated with higher level of profits. This is explained with the help of diagram 22.1.

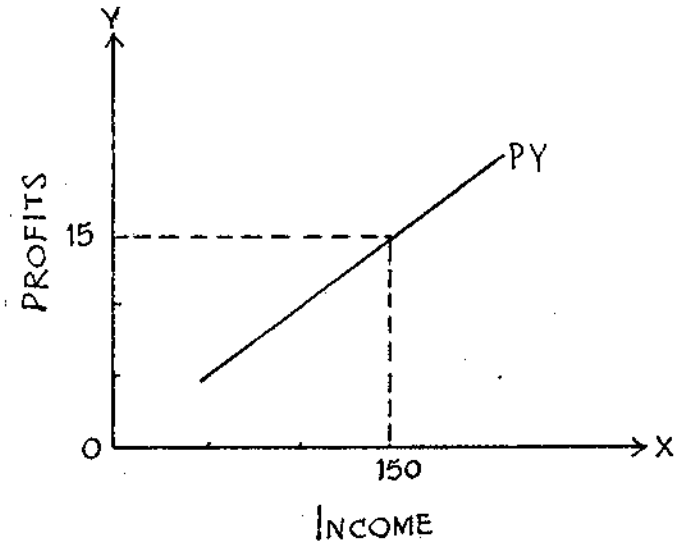


Fig. - 22.1: Relationship between National Income & Profits

Corresponding to the levels of profits, there will be different desired stocks of capital at different rates of interest. More capital stock is required at lower rate of interest and vice-versa.

Stock of capital will be in equilibrium when MEC = rate of interest. MEC decreases as capital stock increases. Capital stock increases upto a point where MEC is equal to rate of interest.

To increase capital stock, larger investment is needed which is possible with lower rate of interest. Larger will be the investment required to increase capital stock and vice versa. Higher level of income needs higher level of investment and vice versa.

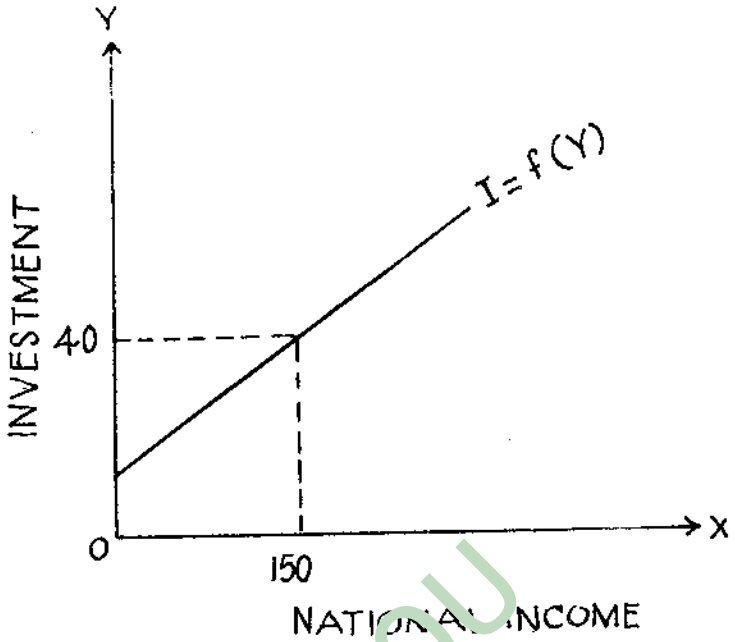


Fig. - 22.2 : Investment Function

Investment function (in diagram 22.2) shows that, investment depends on level of income, provided MEC, rate of interest and profits are in consonance with each other.

Here investment function shows that, to increase the level of induced investment, higher level of income is needed. (To increase level of income, aggregate demand can be increased by autonomous government expenditure). We know that Y = f(I) and I =f(Y). If income is increased, maintaining aggregate demand, profits will increase. To satisfy the level of profits, how much additional capital is required depends on rate of interest, marginal efficiency of capital, etc. So the level of investment depends on income also. Briefly, we can say that investment is a function of income, but MEC plays key role in it.

Check Your Progress - 1

1. *Define investment.*
2. *Differentiate real investment from financial investment.*
3. *What is net investment?*
4. *What is investment demand?*
5. *What are the factors which determine induced investment?*
6. *What is autonomous investment?*
7. *What is investment function?*
8. *List the factors determining investment.*

22.3 Determinants of Investment Demand

Investment demand is the demand for additional capital. Components of investment demand are autonomous investment and induced investment. Demand for autonomous investment depends on government policies and decisions. To increase employment facilities or to improve social justice, government may invest on public utilities and public undertakings. In absence of such autonomous investment, demand for investment coincides with demand for induced investment.

Determinants of such induced investment are:

(i) Savings,
(ii) total profits,
(iii) expected returns,
(iv) MEC,
(v) cost of capital,
(vi) rate of interest,
(vii) technology, etc.

22.3.1 Savings

Keynes showed that savings do not determine investment. It is the investment that determines savings. Increase in savings need not increase investment as the decrease consumption, aggregate demand and marginal efficiency of capital. Given the rate of interest, decreased MEC brings down investment. Therefore, we can discard savings as a determinants of investment. Increased savings in depression could not increase investent in the U.S.A. in 1930s. In underdeveloped countries savings may influence investment. But Keynes theory was formulated by keeping European and American conditions in view.

22.3.2 Total Profits

Empirical studies revealed that total profits reaped are higher, if the expected profits are higher (profits is surplus of revenue over cost and depreciation). Increase in profits associated with increase in national income certainly promotes investment. These profits with the help of other variables determine investment.

22.3.3 Expexted Returns

Given the supply cost and rate of interest, higher the returns we expect greater will be the investment. Higher expected returns do not mean higher rate of returns. Given the costs, higher returns offer higher rate of profit.

22.3.4 Marginal Efficiency of Capital

It is the expected rate of profit, given the rate of interest. Higher MEC means conditions are propitious for expansion. As long as MEC is greater than rate of interest, the investment goes on increasing even if the rate of interest is rising. MEC estimation may change depending on conditions prevailing. If expectations go wrong, enterpreneurs will be more careful while investing money.

22.3.5 Cost of Capital

Due to increase in input costs, increase in depreciation and obsolesunce cost of the project will increase. Given the returns, increase in costs decreases rate of profits or MEC. Reduction in costs

increase availability of funds for further investment, and increase the profit rate. Keynes didn't consider it much as he assumed constant prices.

22.3.6 Rate of Interest

It is the reward for the use of capital. Classicals thought that decrease in rate of interest increases investment and vice versa. But as long as MEC is lower than the rate of interest, fall in rate of interest will not induce investment. In America, rate of interest was reduced to minimum level (about 2% p.a.) But investment could not be increased as it was interest-inelastic. Decreasing interest rate (by monetary authority) is like putting a bucket of water in front of horse which is not thirsty. Keynes also proved that equilibrium or equality of investment and savings takes place through income changes, but not through changes in rates of interest.

22.3.7 Technology

Improvement in technology decreases costs of production or increases productivity with quality improvements and saving of time. Such technological change improves MEC, and positively influences investment.

Investment function shows that it is dependent on MEC and other factors. This shows the forces influencing investment. Interaction between investment and income determines directions and magnitude of employment and income levels.

22.4 The Liquidity Preference Theory of Rate of Interest

Liquidity preference theory is used to explain the determination of rate of interest. Payment made for the use of capital is called rate of interest.

Neo classical economists believed that marginal productivity of capital is the rate of interest. Before Keynes, classical economists derived rate of interest through demand for and supply of capital. Keynes relied on supply of and demand for money to determine rate of interest. But the demand for money for Keynes was completely different from that of the classicals. Keynes said that money has store of value hence money will be kept in hand.

Demand for money is not due to its ability to exchange as believed by the classicals, but is due to its store of value, says Keynes. Money can be kept in the form of cash or other assets like securities, bonds and shares, etc.

22.4.1 Demand for Money

The desire to hold money in hand by the people is the demand for money. People hold money in their hands to meet different requirements of demand. This total demand for money, given the money supply at a point of time determines rate of interest. According to the theory proposed in Keynes' book *"The General Theory of Employment, Interest and Money"*, there are three motives for holding or demanding money. They are : 1. transaction motive, 2. precautionary motive, and 3. speculative motive.

22.4.2 Factors Determining the Demand for Money

Total demand for money is the sum of demand for money for transactions, precautionary and speculative purposes. These factors, depending on level of income and rate of interest, determine

demand for money. Let us discuss the three factors (motives) which determine the demand for money.

22.4.3 Transactions Motive

People want to keep some cash in their hands to purchase day-to-day requirements (like provisions, rice, tea, clothes, etc.). Time gap between income and expenditure makes people hold some cash (i.e. demand for money). The money demanded for transaction motive depends on the size of income,nature of transactions, methods of payment, length of the interval of the receipt of income, rate of interest and cost of transferring funds, etc. Shapiro says, " if the amount that a person received at each point in time equated the amount that he or she paid out at each point in time, no money balance at all would be required for transactions". Given the level of income, if a worker gets wages daily, he keeps less cash balance for transactions. Suppose his payments are made once in a month, then he has to keep larger cash balance at a time to meet daily requirements of the month's period. Money is held as a convenient way of bridging the time between income receipts and expenditure. Transaction demand for money increases with increase in level of income and decrease in rate of interest.

22.4.4 Precautionary Motive

To meet unexpected increases in expenditure or unanticipated delays in receipts (to meet unexpected medical bills, transport charges, delay in payments due to budget constraints) some cash has to be kept in hand. Such demand for cash balance is called precautionary demand for money. Money kept for precautionary purposes changes with income, nature of the people, rate of interest, etc.

22.4.5 Speculative Motive

Demand for cash for speculative purposes mainly depend on expectations about future earnings of their assets. People do not spend their savings entirely on bonds and securities because of uncertainities in rate of interest on one hand and the safety of investment funds on the other. *Bonds* are like promissory notes yielding some fixed rate of interest for the contract period. *Shares* are issued by new firms with an aggrement that the profits will be distributed to shareholders. Yields on shares from year to year may change. Bonds and shares are transferable also.

The speculative demand for money is for the purpose of gaining returns or avoiding losses from changes in capital asset values. Every one tries to earn maximum returns by investing their savings, and they try to minimise risks and losses. The uncertainity of future interest rate causes people to hold money for speculative purposes. If future rates of interest are perfectly anticipated, there will be no speculative demand for money.

After meeting the demand for transactions and precautionary motives people will be left with some surplus of income. This can be invested in securities like bonds or can be kept in hand only for speculative purposes.

Suppose a bond gives 12% rate of interest, and people spend their surplus money on bonds. If they do not purchase bond or security, they will lose Rs. 1 every month on every Rs. 100.

Assume that a person purchases 5 years bond yielding 12% rate of interest. After one year, if market rate of interest increases to 24% then the bond value will decrease in the market. It may not be even sold for Rs. 50, though he spent Rs. 100 on the bond a year back. Because of this fear, people (some times) prefer to keep cash balances in their hands especially when rate of interest is low.

If the market rate of interest is very low, people keep their surplus in their hands only, because the loss of interest on account of such holding will be marginal. On the other hand they hesitate to hold cash for speculative motive if high rate of interest prevails. So, we can say that speculative demand for money is inversely related to rate of interest. Higher the rate of interest, lower will be the speculative demand (L_2) for money and vice versa. L_2 curve in diagram 22.3 shows speculative demand for money. The amount earmarked for such speculative purpose is called specualitive demand for money, i.e., L_2. Downward sloping L_2 curve shows inverse relation between rate of interest & speculative demand for money.

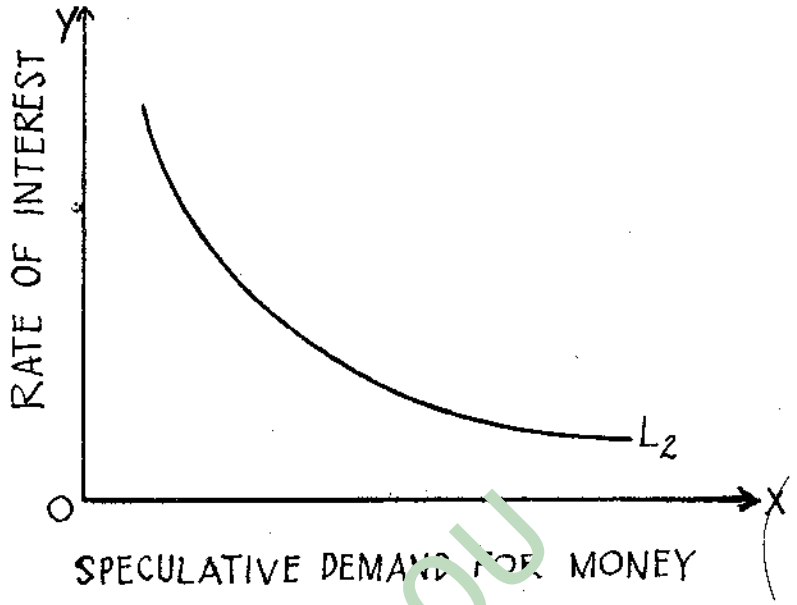


Fig. - 22.3: Speculative Demand for Money

22.4.6 Liquidity Preference

The total demand for money is called liquidity preference. *Liquidity preference* for money is the sum total of the transactions demand, precautionary demand and speculative demand for money. Suppose at 10% rate of interest people keep Rs. 300 for L_1 purpose i.e., for transactions and precautionary motives. Further at the same rate of interest, let us say Rs. 200 are kept for speculative pruposes i.e., L_2. Then total demand for money at 10% rate of interest is $L_1 + L_2 = 300 + 200 = 500$, as shown in diagram 22.4

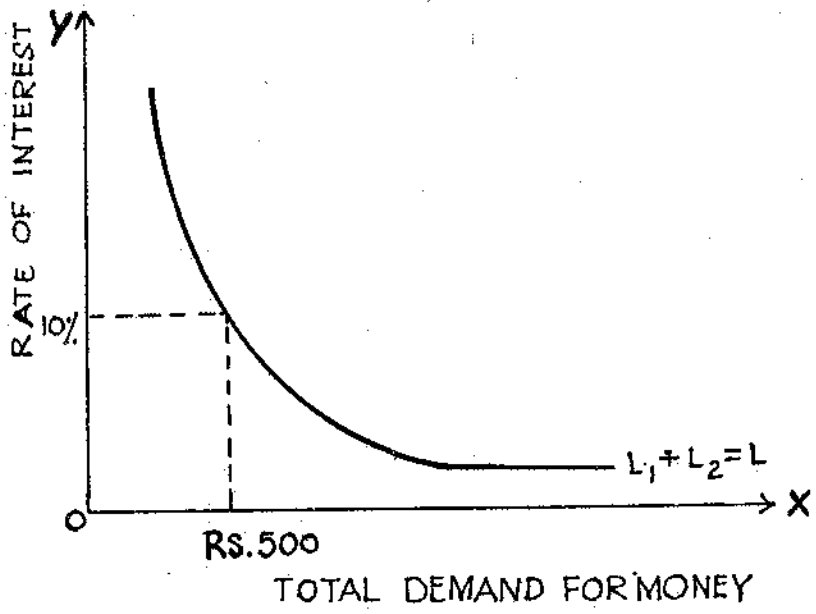


Fig. 22.4 : Liquidity Preference Curve

Given the level of income, liquidity preference or total demand for cash holding increases with fall in rate of interest.

At minimum level of rate of interest, liquidity preference curve becomes highly eleastic. Here, rate of interest can not fall below certain level. Liquidity preference curve position at minimum rate of interest is called *liquidity trap*.

Liquidity preference mainly depends on two factors, namely, (i) the level of income, and (ii) rate of interest.

Increase in income shifts liquidity preference curve to the right. At same 10% rate of interest, if income in the economy increases to Rs. 2000, the liquidity preference may increase from Rs. 500 to 1200. Liquidity preference is Rs. 500 at 10% rate of interest with income of Rs. 1000 (see figure 22.5). The liquidity preference curve is the demand curve for money at a point of time.

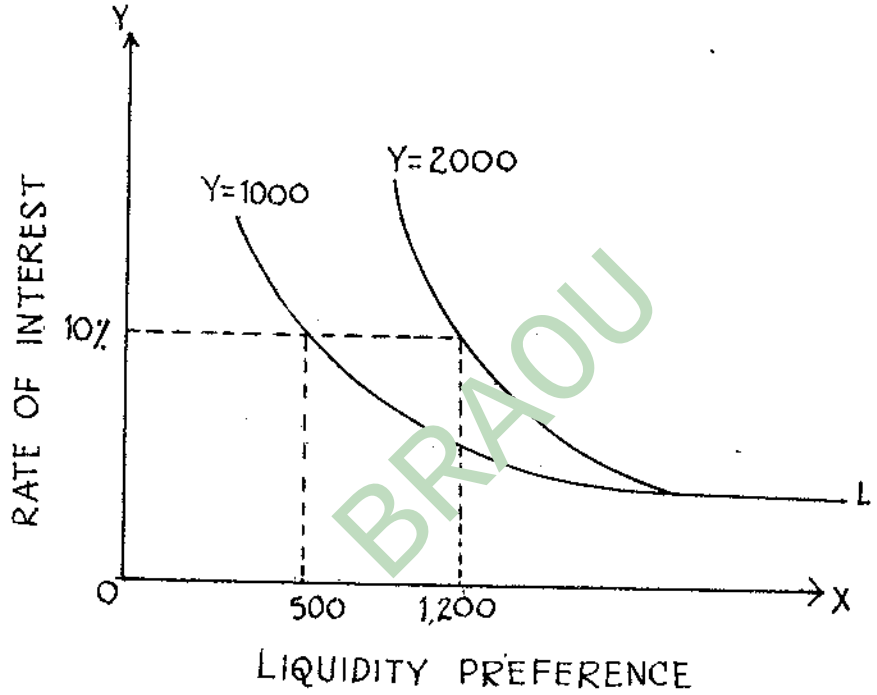


Fig. - 22.5 : Liquidity Preference Curve

22.5 Determination of Rate of Interest - Demand for and Supply of Money

This theory of rate of interest is based on liquidity preference theory. Rate of interest will be determined by supply of and demand for money. Supply of money, i.e., currency, and notes etc., at a point of time is fixed or given. Money supply line will be vertical line (given as MS in diagram 22.6). Demand for money is shown by liquidity preference curve L. It shows that when level of income is Rs. 1000 in the economy at 12% rate of interest, people's liquidity preference or desire to hold money is Rs. 200. The L curve shows liquidity preference at different rates of interest (given the income). The L curve is the demand for money, MS curve is the Money Supply line which is fixed at a point of time.

The rate of interest will be in equilibrium at that point, where demand for money is equal to supply of money. The demand and supply forces bring rate of interest to the equilibrium level of 8% as shown in diagram 22.6. Demand and supply are equal at point E. Here, both supply and demand are Rs. 600 at 8% rate of interest.

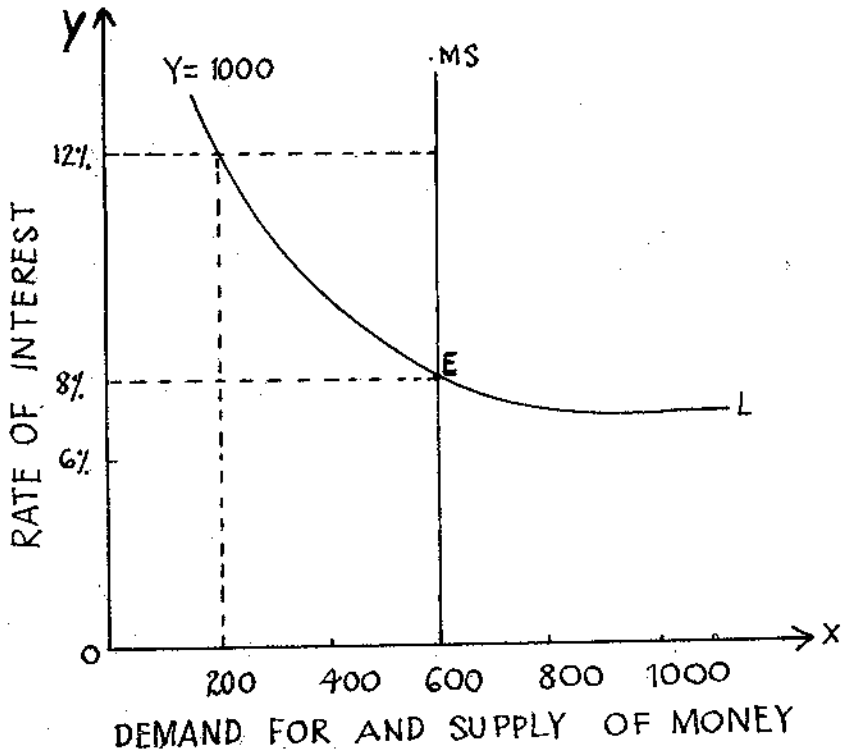


Fig. - 22.6 : Demand for and Supply of Money

If market rate of interest unexpectedly rises to 12% then the demand for money becomes Rs. 200 compared to total money supply of Rs. 600. Now people think that they have more or excess money than what is needed for speculation and other liquidity needs. With that excess money (of Rs. 400), they will purchase bonds and securities (otherwise they will lose interest on their money balance of Rs. 400). This bids up the prices of bonds and securities, and the rate of interest realized on bonds and securities decreases. To say simply, at higher rates of interest, demand for money is less than supply. The excess supply of money (relative to demand) puts downward pressure on the rate of interest.

The Keynesian Monetary theory based on liquidity preference and money supply determines the rate of interest. This approach is called L- M (liquidity and money supply) approach.

Liquidity preference theory explains the termination of rate of interest given the money supply as shown in the foregoing analysis.

Check Your Progress - 2

9. Liquidity preference theory explains the determination of _____

10. What is demand for money?

11. List the determinants of demand for money .

12. Explain transactions motive of demand for moeny.

13. What is precautionary demand for money?

14. Show the relationship between speculative demand for money and rate of interest.

15. What is liquidity preference?

16. *What is liquidity trap?*

17. *Does rate of interest depend on supply of and demand for money?*

22.6 Summing Up

Investment function shows its dependence on MEC, rate of interest, level of profits, income, technology, etc. Investment will be influenced by rate of interest, but not through changes in savings. Rate of interest mainly depends on demand for money i.e., liquidity preference and supply of money. Investment function under uncertainity conditions reveals the undercurrents of the operations of different variables, and unearths the problems involved in bringing full employment equilibrium.

-Prof. D. Narasimha Reddy
& Sri. G.V. Ranga Rao

22.7 Suggested Books

1. Ackley, G. : Macro Economic Theory
2. Stonier and Hague : A Text Book of Economic Theory
3. Edgmand, M : Macro Economics
4. Hansen, A. : A Guide to Keynes
5. Shapiro, E. : Macro Economic Analysis

22.8 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. What is investment function? What are the determinants of investment function?
2. Explain the liquidity preference theory of interest.
3. Explain the factors determining demand for money.

II. Answer each of the following questions in about 15 lines.

1. What is investment demand? What are its determinants?
2. What is speculative demand?
3. What is liquidity trap? Show it graphically.
4. Explain the determination process of rate of interest through demand for and supply of money.
5. What is liquidity preference? Explain it graphically.
6. Explain the transactions and precautionary motives.

Unit - 23 : Integrating the Monetary and Physical Factors

Contents

23.0 Aims and Objectives

This unit describes the inter-dependence of goods and money markets in the determination of general equilibrium.

After reading the unit, you will be able to

* sketch the sequence of Keynesian theory of income determination, and
* explain diagrammatically the integration of commodity and money markets.

23.1 Introduction

So far the money market and goods market are treated seperately for analysis. In macro-economic framework everything depends upon everything else the essence of general equilibrium analysis.

Keynesian Criticism to Classical Theory of Interest

The classical economists believed that an economy could be in equilibrium only at full employment. In the classical framework, interest rates performed an important function in bringing together the desired levels of investment and saving. Keynes disagreed with the classical economists and according to him the equilibrium between saving and investment is brought about through changes in the level of income and not through changes in the rate of interest. The main Keynesian objection is that while constructing the saving and investment schedules, the classical approach assumed full employment. If the saving and investment schedules intersect at negative rate of interest, there will be unemployment. The interest rate cannot change enough to equate the desired investment and saving at the full employment level.

23.2 Sequence of Keynesian Theory of Income Determination

A similar type of logical problem arises regarding the Keynesian analysis. In the simple Keynesian

theory of income determination, the demand for money (L) and its supply determine the rate of interest (i); this in conjunction with the MEC, determines the level of investment (I); which, in conjunction with the consumption schedule, in turn determines the level of aggregate demand and equilibrium income (Y). The trouble is that this sequence (LM→i→I→Y)is treated seperately into two parts, the theory of income determination and the theory of interest. It must be recognised that what happens in one depends on what happens in the other. The probelm with the sequence LM→i→I→Y is that until the level of income is determined, the demand for money cannot be determined and the liquidity preference curve (L) cannot be drawn. Specifically the transactions demand for money depends directly on the level of income. The higher the level of income, the more the money held for transactions. Therefore, one cannot determine the rate of interest until the level of income is already known. Thus the logical problem that arises in the Keynesian system is : the level of interest cannot be determined until the level of income is known, and the level of income cannot be determined until the level of income is known, and the level of income cannot be determined until the interest rate is known. Thus the classical emphasis on interest rate leading to equilibrium betwen savings and investment or the Keynesian emphasis on income changes adjusting the savings and investment run into rough ground. What is needed is some way of determining the rate of interest and the level of income simultaneously.

J.R. Hicks and Alvin Hansen proposed a way of integration of the money and goods markets. Their model brings together investment demand (I), savings (S), the demand for money (L) and the quantity of money (M) and shows how these four items jointly determine national income and the rate of interest simultaneously. This approach of integration of commodity and money markets to explain the general equilibrium is familiarly known as the IS-LM approach or a Keynesian-classical synthesis.

Check Your Progress - 1

1. *What is the Keynesian sequence of equilibrium income?*
2. *Transaction demand for money depends on* _____
3. *Who did propose IS-LM approach?*
4. *What does IS-LM approach explain?*

23.3 Integration of Commodity and Money Markets: IS-LM Approach

23.3.1 Equilibrium in the Goods Market : IS Curve

The IS-LM approach has two parts : the first draws together the determinants of equilibrium in the market for goods, and the second draws together the determinants of equilibrium in the market for money. First, let us start with the analysis of equilibrium in the goods market. A fundamental condition for equilibrium is that desired investment and saving must be qual. The importance of this condition in determining the equilibruim income and interest rate is illustrated in figure 23.1. Part (a) of the figure illustrates the investment function. The investment spending and the rate of interest vary inversely. Part (b) shows the necessary condition for equilibrium-saving must equal investment. With saving and investment on the two axes; the equilibruim- condition of S = I is shown as a 45° line from the origin.Part (c) brings in the saving function and shows what level of income is necessary to call forth the saving determined in Part (b). Part (d) shows the goods market equilibrium and illustrates how the investment-saving (IS) curve can be derived from parts a, b and c.

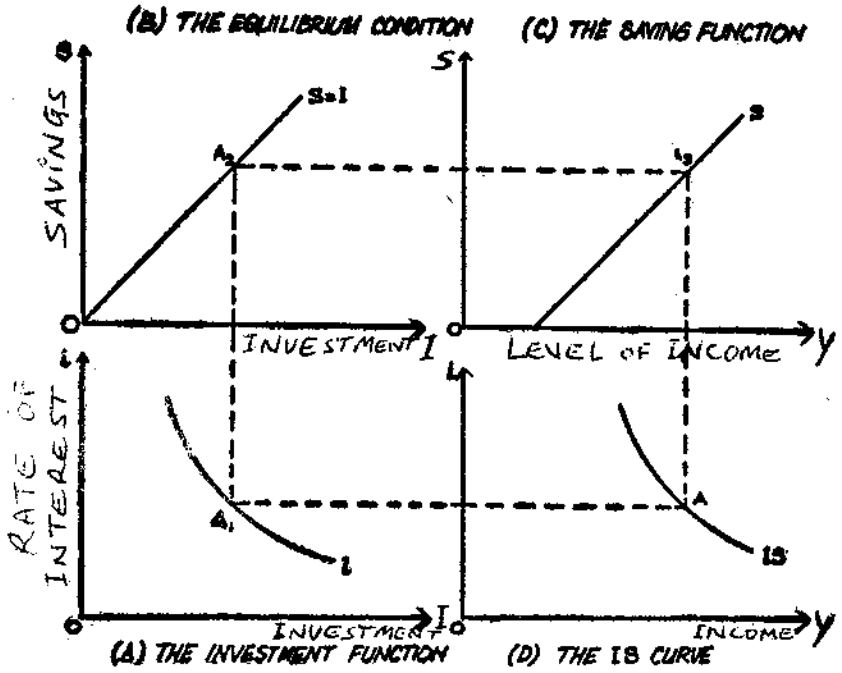


Fig- 23.1: The Goods Market : Derivation of IS Curve

To show how the IS curve is derived, let us begin with part (a) taking a point A_1 which represent an interest rate of i_1 and investment of I_1. If this investment is carried to A_2 in part (b), the equilibrium saving is given as S_1. The level of income at which saving will be equal to S_1 can be derived by extending S_1 to point A_3 in part (c). The equilibrium level of income thus derived is Y_1. If the rate of interest i_1 in part (a) and the level of income Y_1 in part (c) are extended to part (d) we have the point A on IS curve representing equilibrium in the goods market. Starting with various interest rates and tracing them through the system of four parts will result in points of intersection that lie on a schedule called the IS curve.

The IS curve shows the combinations of income and interest rates at which desired investment and saving are equal. The saving function is an alternative way of showing the consumption function. Thus, the IS curve represents equilibrium in the market for consumer and investment goods; it represents equilibrium in the goods market.

23.3.2 Equilibrium in the Money Market:The LM Curve

Now let us turn to the equilibrium in the money market. Here we bring together the demand (L) for and the supply (M) of money. With a procedure similar to that used to derive the IS curve, we may derive the LM curve. LM curve shows the combinations of income and interest rates at which the demand for money equals the quantity of money in the economy.

Figure 23.2 illustrates money market and its operation. In Part (a) the speculative demand for money is shown. Once the rate of interest is known, the amount of money to hold to satisfy the speculative demand can be determined. At A_1 point the rate of interest is i_1 and corresponding to that the speculative demand for money is L_1. In part (b) the supply of money is represented by the straight line connecting the two axes. This line shows that the entire money supply can be used for transactions purposes or for speculatiive purposes or any combination of both. Once the speculative balances have been determined in part (a), the remainder of the money supply must be available to meet the transactions demand. Starting from point A, in part (a) and extending the speculative demand for money of L, to part (b) we obtain A_2 on the constant money supply line. At A_2, the transctions demand for money is T_1. Part (c) shows the transactions demand for money as a function of the level of income. Extending the T_1 of transactions

demand for money to part (c), point A_3 is reached where the equilibrium level of income is Y_1. Once the level of income is known, it can be extended down to part (d) where a money market equilibrium is determined by the intersection with the extension of the interest rate from part (a). In figure 23.2, extending the rate of interest, i_1 from part (a) and income level Y_1 from part (c) to the part (d), the equilibrium is reached on the LM curve at point A. Other points on the LM curve can be derived in a similar manner. The LM curve connects all points that represent combinations of Y and i that make M equal to L and that are money market equilibrium positions.

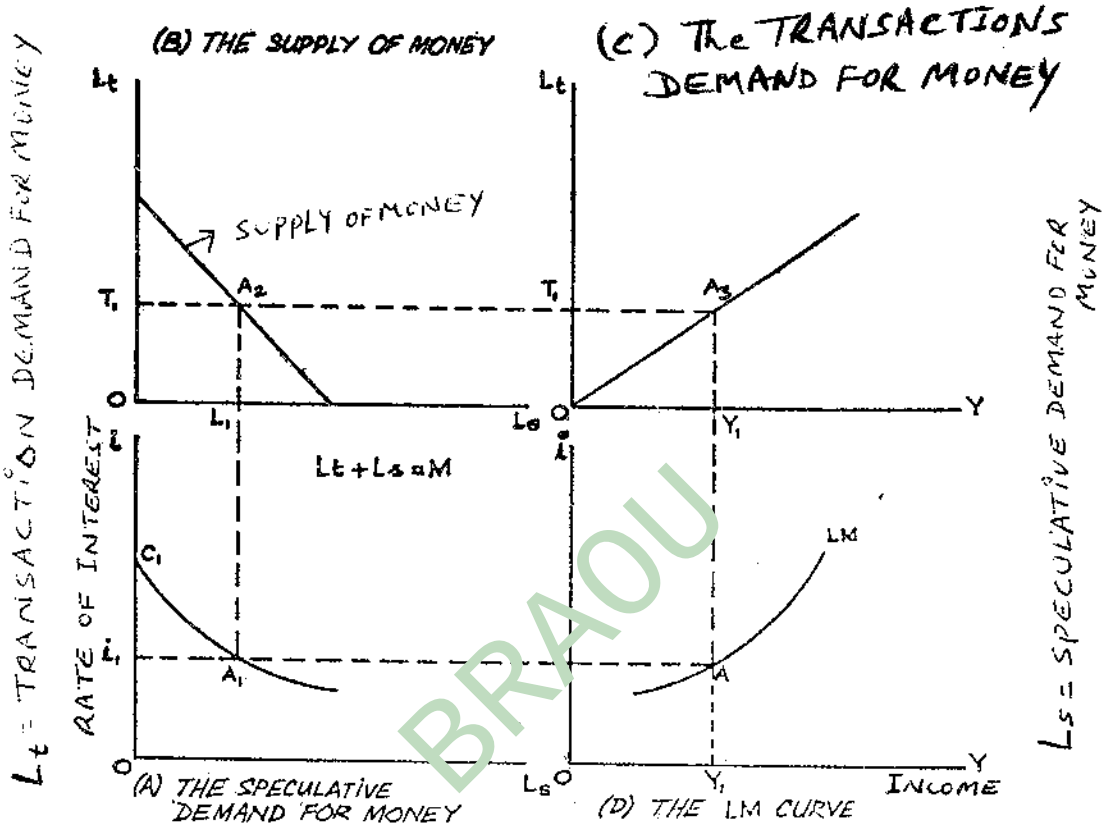


Fig- 23.2 : The Money Market : Derivation of LM curve

In the money market Y and i vary directly. When interest rates are high, speculative balances diminish, leaving more money for transactions purposes. Conversely, when interest rates are low, more money is held idle in speculative balances and not spent and thus it inhibits income growth. Note that the the LM curve has two extremes at which it becomes a straight line. Points B, B_1 and C, C_1 in parts (a) and (d) represent these extremes. At a certain minimum rate of interest, say B, in part (a), there is the liquidity trap. Interest rate cannot fall below B, no matter how great the quantity of money available for speculative purposes. This liquidity trap is also shown up in LM curve in part (d). The equilibrium level of rate of interest cannot fall below a minimum, no matter how low the level of income. At the other end, the LM curve becomes vertical at intersects above point c. This reflects the fact that above c, the speculative demand for money become zero.

23.3.3 Equilibrium of Income and Interest

We may now bring together the LM curve, which represents equilibrium in the money market and the IS curve representing equilibrium in the goods market. Both IS and LM curves describe a relation between various combinations of Y and i. Certain combinations of Y and i are consistent with goods market equilibrium, where S = I and certain combinations of Y and i permit a money market equilibrium, where L=M. Only one combination of Y and i permits an equilibrium in both markets simultaneously and this is the general equilibrium condition. Figures 23.3 bring together the IS and LM curves and explain the

general equilibrium. Here the rate of interest and the equilibrium level of income are determined simulataneously.

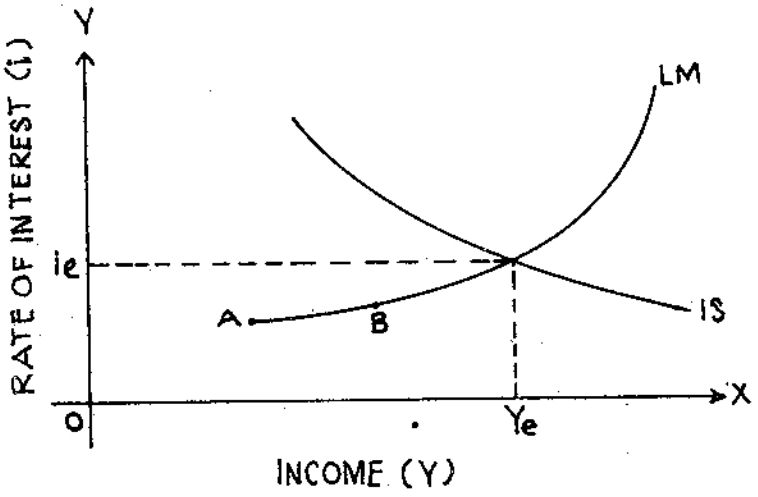


Figure- 23.3: The IS and LM curve : General Equilibrium

The intersection of the IS and LM curves gives the unique combination y_e and i_e that satisfied the equilibrium condition in both markets and thus a general equilibrium condition is reached. Any other combination of Y and i would set in motion market forces that will return the economy to the original equilibrium given by y_e and i_e

Check Your Progress - 2

5. *What does IS curve explain?*

6. *What does LM curve show?*

7. *Show diagrammatically the intersection between IS and LM curves.*

23.4 Summing up

To sum up, we may list the main components of the equilibrium in the goods and money market (general equilibrium) as consisting of four fundamental functions:

1. Investment as a function of the rate of interest.
2. Saving as a function of income.
3. The speculative demand for money as a function of the interest rate.
4. The transactions demand for money as a function of income

The quantity of money is taken as given, determined by the Central Bank. The two equilibrium conditions are :

1. The desired investment equals saving, and
2. The demand for money equals the quantity of money.

23.5 Suggested Books

1.	Stonier and Hague	:	A Text Book of Economic Theory
2.	M. L. Seth	:	An Introduction to Keynesian Economics
3.	Edward Shapiro	:	Macro Economic Analysis

23.6 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Explain the IS-LM approach.
2. Explain and illustrate diagrammatically the equilibrium in goods market.
3. Examine graphically the equilibrium in the money market.

II. Answer each of the following questions in about 15 lines.

1. Explain the integration of money market and goods market with the help of IS-LM curve.
2. What is the impact of liquidity trap on the efforts to raise the levels of income through expansion of money supply?

BLOCK - VIII

IMPORTANCE OF MACRO ECONOMIC ANALYSIS

This block at the end of this book tries to apply macro economic theory, especially of Keynesion theory to under-developed countries. The Unit - 24 explains the concept of equilibrium in the opinion of Keynes. How Keynesion analysis is not applicable to under-developed countries is discussed in the last Unit.

This block consists of the following 2 units :

Unit - 24 : Keynesion Concept of Equilibrium

Unit - 25 : Relevance of Keynesion Economics to Under-developed countries.

Unit - 24: Keynesian Concept of Equilibrium

Contents

24.0 Aims and Objectives

This unit explains the concept of equilibrium and its implications in combating the problem of unemployment.

After reading the unit, you will be able to

* distinguish between classical theory and Keynesian theory,
* explain different concepts used in the Keynesian analysis of equilibrium,
* discuss, in detail, the Keynesian concept of equilibrium level of full employment, and
* identify the implications of Keynesian theory.

24.1 Introduction

In 1930s there was a general depression in almost all the industrially advanced countries. The prevalent theories of 1930s classical economics like J.B. Say's law of markets, assumption of full employment did not indicate the relevant policies to tackle the problem of the depression. Keynesian theories came to the rescue of the governments in forming their public policies in order to increase output and employment and thereby solve the problem of depression.

24.2 Classical versus Keynesian Theory

Classical economists mainly concerned with full employment equilibrium. Keynesian theory explained the determinants of the volume of employment at any given time whether it is full employment, or unemployment. Classical writers assume that there is a tendency for the economic system based on private poverty in the means of production to be self adjusting at full employment level.

(1) Classical economists argued that the operation of market forces would result automatically in full employment. If there is unemployment, wage rates will fall as a result there will be full employment in the economy. Keynes argues the downward adjustments in the prices and wages are difficult.

Full employment concept is also passed on Say's law, which states that supply creates its own demand. It is true in the process of production, incomes are paid to the factors of production. Thus incomes are spent and as a result demand is generated. However, it does not add up to the supply created. This can only happen in the barter system. But in money economy savings are possible and as a result the supply of and demand for output need not coincide.

Investment increases the real capital stock and it plays an important role in any economy for it adds to the productive capacity of the economy. However, it is not necessary that savings of the society will be equal to the desired investment for savings and investments are made by the different sets of people for different reasons. Savings are made primarily by the household out of their incomes. Investments are made by business corporations motivated by property. According to Keynes, it is the divergence between savings and investment that causes fluctuations in income. If desired investment exceeds savings, the economy is pushed forward to expand its output and vice-versa. More importantly there is no guarantee that the amout of investment decided by entreprenuer will be equal to that needed to secure full employment. But Keynes explains that the volume of employment is determined by the level of effective demand. When demand is deficient, it results in unemployment and when it is excessive, it results in inflation. Thus the main difference between the classical theory and Keynesian theory is the assumption that full employment is normal for the former and the assumption that less than full employment is normal for the latter.

24.3 Keynesian Analysis of Equilibrium Level of Full Employment

To understand Keynesian concept of equilibrium levels of output and employment, we must have some knowledge about his revolutionary concepts like i) aggregate supply ii) aggregate demand, iii) effective demand and iv) under employment and full employment equilibrium. First, let us know the concept of full employment.

24.3.1 Concept of Full Employment

Keynesian theory deals with changes in output and employment in the economic system as a whole. His concept of full employment is consistent with voluntary, frictional, technical and seasonal unemployment. Full employment exists in the absence of involuntary unemployment. Total employment depends on aggregate demand and unemployment results in deficiency of demand. As employment increases, income increases and as a result consumption will also increase but by less than income. Therefore to have sufficient demand to sustain an increase in employment there must be an increase in real investment equal to the gap between the income and consumption demand out of that income. In other words, employment cannot increase unless investment increases.

24.3.2 Aggregate Supply

Each entrepreneur is motivated by profit and will employ that number of workers so that he can get maximum profit. The total number of those employed by all the entrepreneurs is the total number of employed persons in the whole economy. A certain minimum amount of income is necessary to induce entrepreneurs to employ any given aggregate amount of employment. This minimum income is called aggregate supply. The aggregate supply function is a schedule of the minimum amount of receipts required to employ varying quantities of employment. As the aggregate supply increases more employment is offered. In simple equation of Keynes,

$Y = C + S$. It represents amount of aggregate supply.

24.3.3 Aggregate Demand

The aggregate demand is the amount of money which is expected by all the entrepreneurs by the sale of their aggregate output at a given level of employment. Aggregate demand price increases as the amount of employment increases and decreases as the amount of employment decreases.

$Y = C + 1$. It represents the amount of aggregate demand.

24.3.4 Effective Demand

There will be some amount of employment for which aggregate supply exceeds aggregate demand and for some amount of employment aggregate demand exceeds aggregate supply. At a particular level of employment aggregate demand equals aggregate supply. This level of demand is called effective demand. If aggregate demand exceeds aggregate supply, output and employment increase. On the other hand if aggregate supply exceeds aggregate demand, output and lemployment decrease. At the level of effective demand, output and employment will be in equilibrium. But, at this level of equilibrium, there may be full employment or unemployment.

$Y = C + S$

$Y = C + I$

$S = I$.

24.3.5 Underemployment and full employment equilibrium

If the effective demand is at low level, it cannot give full employment. There will be unemployment, so it is called *underemployment equilibrium.* In lorder to achieve full employment, we have to raise the level of effective demand. The level of effective demand can be raised by an increase in aggregate supply or aggregate demand. But aggregate supply cannot be increased independently. It is dependent on the level of output. Hence, we have to increase aggregate demand by increasing autonomous investment or Government expenditure. With an increase in aggregate demand, there will be an increase in the level of effective demand and equilibrium point. If the effective demand is raised to such a level where involuntary unemployment is absent, that level of equilibrium is called *full employment equilibrium.* Even after this full employment equilibrium, if we further increase aggregate demand there will be no increase in output and employment. Here aggregate supply becomes inelastic and prices rise and this leads to inflation.

Keynes defined full employment equilibrium to mean that particular situation in the economy in which an expansion of effective demand fails to bring out an expansion of output and employment. Beyond this point, the volume of employment will not increase because all the available resources in the economy are already fully employed. If the effective demand still rises, it will lead to a rise in the price level.

24.3.6 Graphical Presentation of Equilibrium

This can be explained with the help of the following table.

Table - 1 :- Aggregate Supply and Demand (Rs. in Crores)

Employment (in Lakhs)	Aggregate Supply	Consumption	Invest-ment	Govern-ment ex-	Aggregate demand
10	50	60	20	20	100
20	100	100	20	20	140
30	150	140	20	20	180
40	200	180	20	20	220
50	250	240	20	20	280
60	300	260	20	20	300
70	350	300	20	20	340
80	400	340	20	20	380

From the table 1, we can understand the Keynesian concept of equilibrium level of full employment. If there is only consumption expenditure, the employment level will be at 20 lakhs as aggregate supply equals consumption expenditure of Rs. 100 crores. Assuming full employment level at the level of 60 lakhs people, the aggregate demand should equal Rs.300 crores. As an aggregate supply a sum of Rs. 300 crores is necessary to maintain that level of employment. If we increase aggregate demand by increasing investment and Government expenditure by Rs. 20 crores each, that full employment level of equilibrium will be achieved.

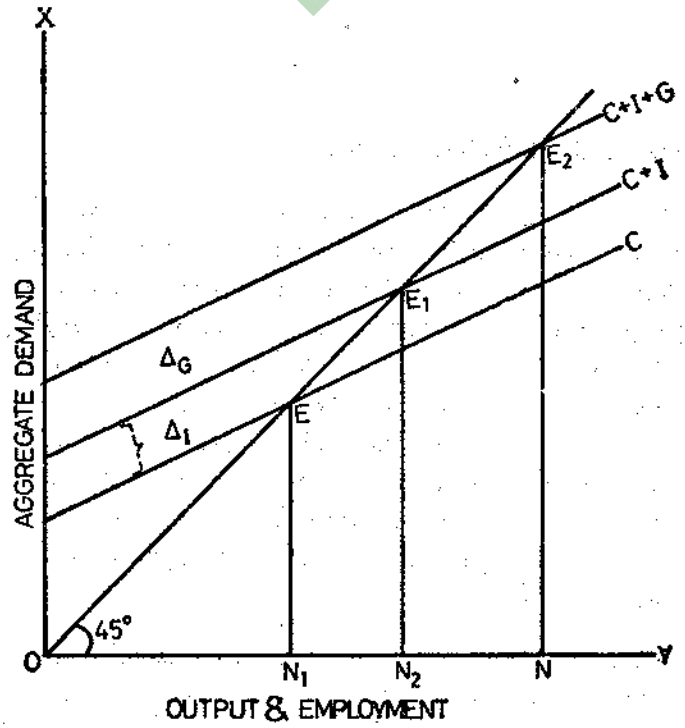


Fig- 24.1: Output and Employment

In the diagram24.1 OX axis represents output and employment and OY axis represents aggregate demand. 45° line indicates the path of effective demand when aggregate demand equals aggregate supply at all levels. When there is only consumption C representing aggregate demand, the effective demand will be at the level of E. The employment level will be at ON_1. Supposing the level of full employment is at ON, the difference between ON and ON_1 will be the level of unemployment. If we increase investment (I) the employment level will increase upto ON_2 from ON_1 with further increase in aggregate demand by increasing the Government expenditure, (G) the equilibrium level will be at E_2. Then the economy will be in full employment.

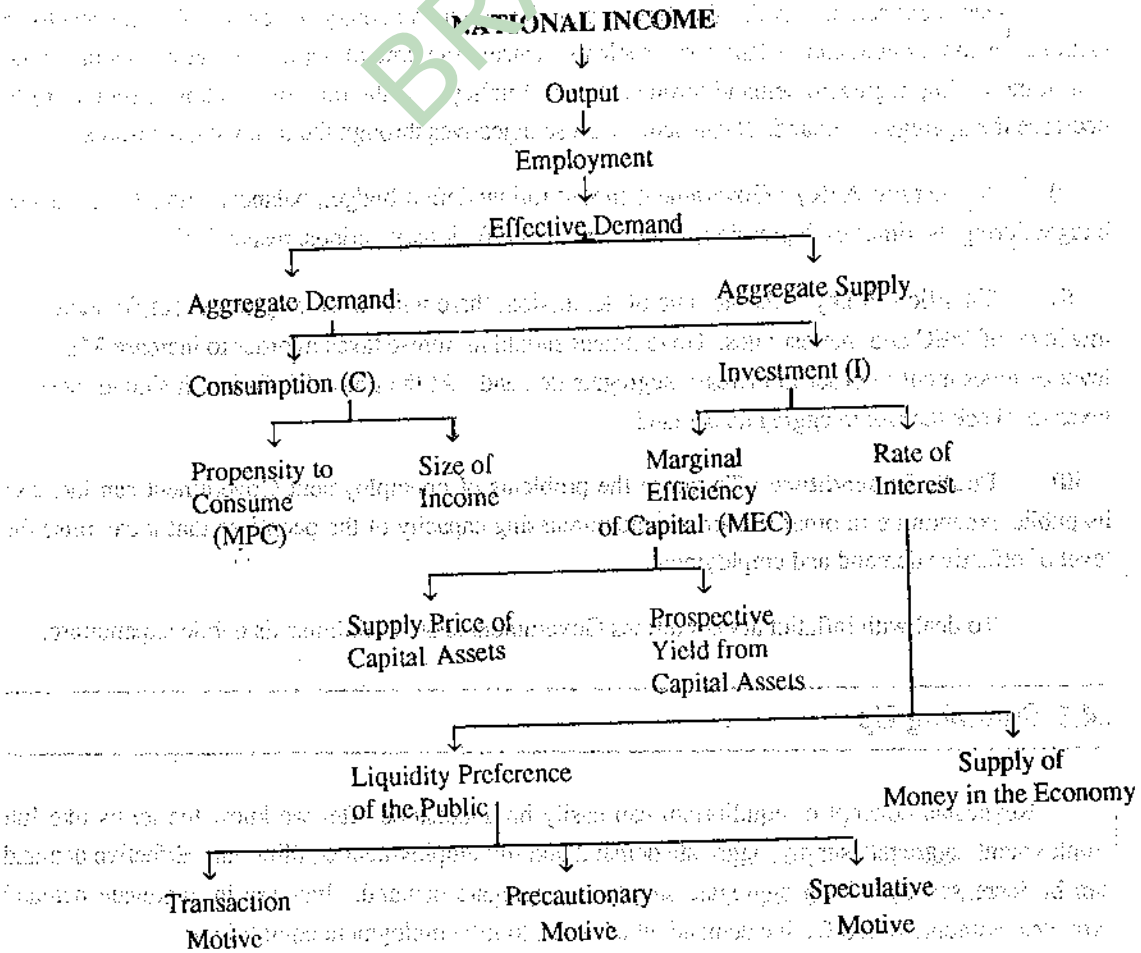
Check Your Porgress-1

1. *What do you understand by the term 'full employment'?*
2. *What is aggregate supply?*
3. *Explain the meaning of aggregate demand?*
4. *What is full employment equilibrium?*

24.3.7 Presentation of Determinants of Equilibrium - A Chart

The following chart presents the relationship among various factors which determine the Keynesian equilibrium of output and employment.

The chart given below tells us various determinants. National income depends on output which depends upon employment and which in turn depends upon effective demand. Effective demand depends upon aggregate demand and aggregate supply.



24.4 Implications Keynesian Theoy

The main objective of Keynesian theory of employment was to tackle the problem of unemployment. If there is wide spread unemployment, the Government should monitor its public policy through changes in monetary and fiscal policies so as to increase employment.

24.4.1 Monetary Policy

During the period of depression, Government should follow cheap money policy. During the period of boom, it should follow dear money policy.

(i) Changes in rediscount rate : At the time of depression, Government should lower the discount rate so that entrepreneurs can get more advances from banks and it leads to expansion in the economic activity. If there is high inflation, the discount rates should be enhanced.

(ii) Cash Reserves : At the time of depression, Reserve Bank should minimise the ratio of cash reserves. Whereas in the boom period, it should raise the ratio of cash reserves so that it can expand credit in the depression and contract credit in boom period.

(iii) Purchase and sale of securities : To tackle depression, Government should purchase securities so it should sell its securities in order to withdraw money from the public. However, monetary policy will not be more effective to tackle the problem of unemployment but it will help to curb inflation effectively.

24.4.2 Fiscal Policy

Government can use its fiscal policy to complement its monetary policy for effective results in tackling unemployment and inflationary problems. During the time of depression, government should aim at increasing aggregate demand through its fiscal policy. At the time of inflation it should try to decrease the aggregate demand. It can achieve these objectives through the following measures.

i) Budgetary Policy : Government should follow deficit budget, balanced budget and surplus budget during the times of degression, equilibrium and inflationary periods, respectively.

ii) Taxation Policy : At the time of depression, there will be wide spread unemployment and low level of MEC and interest rates. Government should minimise taxes in order to increase MEC and level of investment in order to increase aggregate demand. At the time of inflation, it should increase taxes to check the rise in aggregate demand.

iii) Public Expenditure : To tackle the problems of unemployment Government can increase its public expenditure in order to increase the purchasing capacity of the people so that it can raise the level of effective demand and employment.

To deal with inflationary conditions Government should minimise its public expenditure.

24.5 Summing Up

Keynesian concept of equilibrium can easily be understood after we know the terms like full employment, aggregate supply, aggretate demand and full employment equilibrium. Effective demand can be increased by raising aggregate supply or aggregate demand. Increase in aggregate demand provides momentum in effective demand which leads to full employment equilibrium.

We have presented the relationship among different variables in determining the Keynesian equilibrium of employment and output through a chart. Monetary and fiscal policies are shown as measures in tackling the problem of unemployment.

Sri S. Sudhakar Reddy

24.6 Suggested Books

1. Stonier and Hague : A Text Book of Economic Theory
2. M. L. Seth : An Introduction to Keynesian Economics

24.7 Model Examination Questions

I. Answer each of the following questions in about 30 lines.

1. Briefly explain the Keynesian approach for combating the problem of unemployment.
2. What are the monetary and fiscal policies which follow from Keynesian approach to employment?
3. Explain the various determinants of the Keynesian equilibrium level of output and employment with the help of a chart.
4. Explain diagrammatically the Keynesian concept of full employment level of equilibrium.

II. Answer each of the following questions in about 15 lines.

1. Bring out the distinct views of classical and Keynesian theories of employment equilibrium.
2. Explain the meaning of Keynesian concept of equilibrium.
3. Depict a chart which explains the determinants of Keynesian equilibrium of output and employment.

Unit - 25 : Relevance of Keynesian Economics to Under developed Countries

Contents

25.0 Aims and Objectives

This unit examines the relevance of Keynesian analysis to underdeveloped countries.

After reading the unit, you will be able to analyse the relevance of following elements in underdeveloped countries :

* multiplier,
* consumption function,
* investment function, and
* effective demand.

25.1 Introduction

The problems of underdeveloped economies are basically different from those of developed economies. For example the low level of economic activity during the period of depression of a developed economy cannot be attributed to the under developed countries. Depression primarily is a monetary phenomenon. Its origin is from the deficiency of effective demand. In other words, the economy fails to absorb the entire output produced, resulting in an accumulation of unsold goods in the market. Due to this, machines, workers and raw materials temporarly remain unutilised and waiting to be used on the rise of demand. To revive the economic activity, effective demand is to be created. Hence, the need for pumping adequate purchasing power into the monetary stream. This can be done easily by a scheme of public works which employ initially some idle labour and stimulate the private sector to further the economic activity through multiplier effect.

In underdeveloped countries, there are lots of unskilled workers, unutilised and underutilised resources. There is a positive and glaring deficiency of capital equipment and technical know-how. The demand deficiency of Keynes and capital deficiency prevalent in underdeveloped countries are not same. The problem of capital efficiency is more serious and difficult to face since capital formation is

very difficult. The difference is basically between low productive capacity and a high productive capacity which is not fully utilised.

Hence, more creation of monetary demand is not enough to stimulate the entrepreneurs to invest. One has to face many problems in the process of investment. In underdeveloped countries, there is a deficiency of savings, over head facilities, entrepreneurability, skilled manpower or technical know - how and resources. The measures recommended for a developed country to be implemented at the time of depression can generate demand which is bound to remain unsatisfied because of non-adjustability of supply. The method of pumping more money will generate inflationary pressures in the underdeveloped countries because of inelastic supply of output.

Keynes concentrated to a great extent on the cyclical unemployment. It is caused by the slump phase of business cycle. This is due to deficiency of effective demand in relation to the increased productive capacity of the economy. The type of unemployment prevalent in underdeveloped countries is different. It is chronic or open unemployment due to deficiency of capital. Keynes did not suggest measures to eradicate this type of unemployment prevalent in underdeveloped countries. Keynesian policy of 'consume more and 'save less' is not appliclable to underdeveloped countries. The problem in under-developed countries is to have more savings and capital formation. These are very much needed and a must for under-developed countries. Keynes assumes a state of full employment. This does not hold good in under-developed countries. Keynesian economics fail to provide full employment even during boom or prosperity in the underdeveloped countries. So it is difficult to ensure full employment in under-developed countries. The difference between developed and under-developed countries is that in the latter small peasant economy dominates. Production is to a great extent for domestic consumption rather than for the external market. In under-developed countries, market economy is under-developed. Capital equipment is low. Technological development or level is very primitive. Because of the above measures, fixed capital does not play a very important role.

25.2 Multiplier in Under-developed Countries

a) In the under-developed countries secondary, tertiary, and other increases in income, output and employment do not operate in spite of the high rate of marginal propensity to consume.

b) Because of the rigidities offered by the economic organisation, the primary producers cannot increase their output in proportion to income.

c) Since the marginal propensity to consume is high, the major portion of increased income would be spent on consumption goods. This will diminish the marketable surplus of the food grains. Its impact will be there on non-agricultural prices. Thus the forces operating in under-developed countries neither lead to high income nor to high employment.

d) In under-developed countries, we find disguised unemployment but not voluntary unemployment.

25.3 Consumption Function in Under-developed Economy

An increase in income leads to less than proportionate increase in consumption. In other words as income increases consumption also increases but less than proportionately. Marginal propensity to consume (MPC) declines as income increases. In under-developed countries, MPC is extremely high

and MPS is low partly because of low income levels and partly because of high MPC. In under-developed countries, because of low income levels, increases in income tend to be spent mostly on food products and substituting superior types of food products for inferior ones. As it was already pointed out that in under-developed countries, household enterprises dominate. Production is more for self consumption than for the market. So, when there is an increase in income, the MPC leads to an increase in the demand for self-consumption rather than for purchases from the market. As a result of increase in MPC, a reduction in the marketable surplus rather than an increase in output and employment may take place. The economy may plunge into inflationary spirit. So, one of the most significant constituents of effective demand i.e. propensity to consume does not hold good in an under-developed economy.

25.4 Investment Function in Under-developed Economy

Investment function is the most important factor determining effective demand and thereby income, output and employment. Investment depends upon two factors viz. marginal efficiency of capital (MEC) and the rate of interest. MEC is low for many reasons like uncertainities, inflation, high costs, limited and under-developed markets and their sizes and low purchasing power. The level of productivity and real income determine the size of the market. As the level of real income of substantial portion of the population is extremely low, the volume of aggregate demand is not sufficient to warrant mass scale production with the help of sophisticated technology.

The rate of interest and its structure is not very hopeful in stimulating investment. Liquidity preference is high. It arises due to uncertainties and speculation in commodities since the bonds market is not well developed. There is no desire to earn from the fluctuations in bond prices. According to Keynesian economics, an increase in the money supply would lead to a fall in the interest rate and increase in investment and employment. Whereas in under-developed countries, an increase in the supply of money would lead to rise in prices and not a fall in the rate of interest. Despite the scarcity of capital, interest rate is low in under-developed countries. There is vast non-monetized sector in under-developed countries. So changes in the interest rates do not have any influence upon the nature and level of economic activity.

25.5 Effective Demand in Under-developed Economy

a) Employment depends upon effective demand. It manifests itself in the total spending of income (conslumption+investment). Effective demand is low in under-developed countries. This is due to low level of income. There is a great deal of pent-up demand in under-developed countries. It remains unsatisfied due to low level of income and purchasing power.

b) In under-developed countries, an increase in money supply will lead to inflationary pressures. The increase in money supply does not lead to increase in output and employment.

c) In a developed country, there is not only idle manpower but also excess capacity and raw materials. Whereas in an under-developed country, the complementary resources such as capital equipment are deficient. Keynesian theory of effective demand does not hold good in an under-developed country for the problem is more of increasing the supply and raising the marketable surplus than of generating demand.

25.6 Summing Up

In this unit, we have examined whether the Keynesian analysis has any relevance to the under-developed countries, because the problems of under-developed countries are different from those of developed nations. Due to different reasons, explained in the unit, the Keynesian theories need not be applied to underdeveloped economies. But the concepts, used by him, are relevant to any economy.

- Sri S. Sudhakar Reddy

25.7 Suggested Books

1.	M. L. Seth	:	An Introduction to Keynesian Economics
2.	Misra & Puri	:	Indian Economy
3.	Stonier and Hague	:	A Text Book of Economic Theory

25.8 Model Examination Questions

I Answer each of the following questions in about 5 lines.

1. Explain the relevance of Keynesian theories to under-developed countries.
2. Examine the role of consumption and investment functions in under-developed countries.

II Answer each of the following questions in about 15 lines.

1. Explain the relevance of multiplier in under-developed economies.
2. Write a short note on investment function in an underdeveloped economy.

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11. Paul Wonnacott — Macro-economics
12. Dudley W. Johnson — Macro-economics
13. Campgna A.S. — Macro-economics - Theory & Policy
14. K.K. Dewett and A. Chand — Modern Economic Theory
15. M.L. Jhingan — Advanced Economic Theory

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UNDERGRADUATE PROGRAMME
SYLLABUS FOR SECOND YEAR B.A.
ECONOMICS

COURSE - I : ANALYTICAL ECONOMICS

Block - I : Economics - An Introduction

Unit - 1 : Nature and Scope of Economics
Unit - 2 : Economics : Definition and Basic Concepts
Unit - 3 : Methodology of Economics

Block - II : Theory of Consumer Behaviour

Unit - 4 : Utility Analysis
Unit - 5 : Indifference Curve Analysis
Unit - 6 : Theory of Demand
Unit - 7 : Elasticity of Demand

Block - III : Theory of Production

Unit - 8 : Concept of Production Function and Law of Variable Proportions
Unit - 9 : Neo-Classical Production Function
Unit - 10 : Laws of Returns to Scale

Block - IV : Cost and Revenue Analysis

Unit - 11 : Cost Analysis
Unit - 12 : Revenue Analysis
Unit - 13 : Equilibrium of the Firm

Block - V : Market Structure Analysis

Unit - 14 : Concept of the Market - Determiniation of Price
Unit - 15 : Perfect Competition
Unit - 16 : Monopoly and Imperfect Competition

Block - VI : An Introduction of Macro Economics

Unit - 17 : Classical Economic Analysis
Unit - 18 : Classical Theory of Employment
Unit - 19 : Effective Demand

Block - VII : Income Determination

Unit - 20 : Consumption Function
Unit - 21 : Investment and Savings
Unit - 22 : Investment Function and Rate of Interest
Unit - 23 : Integrating the Monetary and Physical Factors

Block - VIII : Importance of Macro Economic Analysis

Unit - 24 : Keynesian Concept of Equilibrium
Unit - 25 : Relevance of Keynesian Economics to Underdeveloped Countries.

Dr. B.R. AMBEDKAR OPEN UNIVERSITY

FACULTY OF SOCIAL SCIENCES
SECOND YEAR (3 YEAR DEGREE COURSE) EXAMINATION
MODEL QUESTION PAPER
ECONOMICS
COURSE - I : ANALYTICAL ECONOMICS

TIME : 3 Hours Max. Marks : 100

Section - A

Note : Answer any four of the following eight questions in about 30 lines each.
Each Question carries 15 marks.
Draw diagrams wherever necessary. 4 x 15 = 60

1. Critically examine the law of diminishing marginal utility.
క్షీణోపాంత ప్రయోజన సూత్రాన్ని విమర్శనాత్మకంగా పరిశీలింపుము.

2. Explain consumer's equilibrium with the help of indifference curve analysis.
ఉదాసీనతా వక్రరేఖ విశ్లేషణ ఆధారంతో వినియోగదారుని సమతౌల్యాన్ని వివరింపుము.

3. Explain the law of variable proportions.
చర అనుపాతాల సూత్రాన్ని వివరింపుము.

4. What is equilibrium of a firm? Explain diagramatically the equilibrium of a firm from the point of view of total cost and total revenue.
సంస్థ యొక్క సమతౌల్యత అనగా నేమి? మొత్తం వ్యయం మరియు మొత్తం రాబడి దృష్ట్యా సంస్థ సమతౌల్య స్థితిని రేఖా పటం ద్వారా వివరింపుము.

5. Explain price determination under monopoly.
ఏకస్వామ్యంలో ధర నిర్ణయాన్ని రేఖా చిత్రం సహాయంతో వివరించండి.

6. Explain the role of marginal efficiency of capital in investment decisions.
పెట్టుబడి నిర్ణయంలో ఉపాంత మూలధన సామర్థ్యం వివరింపుము.

7. What is effective demand? Explain the determinants of effective demand.
సార్థక డిమాండ్ అనగా నేమి? సార్థక డిమాండ్‌ను నిర్ణయించే కారకాలను వివరింపుము.

8. Explain the integration of money market and goods market with the help of 'IS' and 'LM' curves.
'IS' మరియు 'LM' రేఖల సహాయంతో ద్రవ్య మరియు వస్తు మార్కెట్ల సమన్వయతను వివరింపుము.

Section - B

Note : Answer any five of the following ten questions in about 15 lines each.
Each Question carries 15 marks.
Draw diagrams wherever necessary. 5 x 8 = 60

9. What are the characteristics of wants?
కోరికల లక్షణాలను వివరింపుము.

10. Explain the following Concepts :
(a) Positive Economics (b) Normative economics.
క్రింది భావనలను వివరింపుము :
(a) ప్రతిపాదనాత్మక అర్థశాస్త్రం (b) నిర్దేశాత్మక అర్థశాస్త్రం.

11. Explain marginal rate of substitution.
ప్రత్యామ్నాయ ఉపాంత రేటును వివరింపుము.

12. Explain the following concepts :
(a) Pure completition, (b) Monopolistic competition.
క్రింది భావనలను వివరింపుము :
(a) శుద్ధపోటీ మార్కెట్ (b) ఏకస్వామ్య పోటీ

13. Explain the relationship between average and marginal cost curves.
సగటు మరియు ఉపాంత వ్యయ రేఖల మధ్యగల సంబంధాన్ని వివరింపుము.

14. Discuss the following terms :
(a) Price demand (b) Income demand (c) Cross demand.
క్రింది భావనలను చర్చింపుము :
(అ) ధర డిమాండ్ (ఆ) ఆదాయ డిమాండ్ (ఇ) జాత్యాంతర డిమాండ్

15. Explain the characteristics of perfect competition.
సంపూర్ణ (పరిపూర్ణ) పోటీ మార్కెట్ లక్షణాలను వివరింపుము.

16. What is paradox of thrifts? Under what conditions does it hold good ?
పొదుపు వైపరీత్యం అనగా నేమి ? ఇది ఏ పరిస్థితుల్లో సక్రమంగా పని చేస్తుంది ?

17. Explain the meaning of APC and MPC.
సగటు వినియోగ ప్రవృత్తి మరియు ఉపాంత వినియోగ ప్రవృత్తి అను పదాలను వివరింపుము.

18. Explain Say's Law of markets.
'సే' మార్కెట్ సూత్రాన్ని వివరింపుము.

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UNDERGRADUATE COURSE II YEAR

SUBJECT : ECONOMICS

COURSE - I : ANALYTICAL ECONOMICS

ASSIGNMENT NO. 1

Note : 1. Do not copy the answer directly from any of the books.
2. As far as possibly try to answer the question independently in your own words.
3. If it is necessary to quote from any source give the correct reference.
4. Use your own foolscap pages for writing the assignments.
5. Leave sufficient margins for the comments of the evaluator.
6. Completion of this assignment normally should not take more than two hours' time.

I. Answer the following questions in about 30 lines each.

క్రింది ప్రశ్నలకు సుమారు 30 వంక్తులో జవాబులిమ్ము.

1. Distinguish between deductive methods and inductive method. Which is appropriate for Economics?

ఆగమన పద్ధతికి, నిగమన పద్ధతికి గల భేదాలను వివరింపుము. అర్థశాస్త్రానికి ఈ పద్ధతులలో ఏది అనువైనది?

2. Explain the law of diminishing marginal utility. What are its limitations ?

క్షీణోపాంత ప్రయోజన సూత్రాన్ని వివరింపుము. దాని పరిమితులు ఏవి ?

3. Explain the law of variable proportions.

చర అనుపాతాల సూత్రాన్ని వివరింపుము.

II. Answer the following questions in about 15 lines each.

క్రింది ప్రశ్నలకు సుమారు 15 వంక్తులో జవాబులు ప్రాయుము.

1. What is meant by utility? Explain the main forms of utility?

'ప్రయోజనం' అనగా నేమి? ప్రయోజన రూపాలను వివరింపుము.

2. What is price line? Explain it diagramatically.

ధర రేఖ (బడ్జెట్ రేఖ) అనగా నేమి? రేఖా చిత్రం సహాయంతో దానిని వివరింపుము.

3. What are the isoquants? Explain its properties.

సమోత్పత్తి రేఖలు అనగా నేమి? వాటి లక్షణాలను వివరింపుము.

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UNDERGRADUATE COURSE II YEAR

SUBJECT : ECONOMICS

COURSE - I : ANALYTICAL ECONOMICS

ASSIGNMENT NO. 2

Note : 1. Do not copy the answer directly from any of the books.
2. As far as possibly try to answer the question independently in your own words.
3. If it is necessary to quote from any source give the correct reference.
4. Use your own foolscap pages for writing the assignments.
5. Leave sufficient margins for the comments of the evaluator.
6. Completion of this assignment normally should not take more than two hours' time.

I. Answer the following questions in about 30 lines each.
క్రింది ప్రశ్నలకు సుమారు 30 పంక్తులలో జవాబులివ్వుము.

1. What is short period in Economics ? Explain and distinguish between fixed and variable costs
అర్థ శాస్త్ర పరిభాషలో 'స్వల్పకాలం' అంటే ఏమిటి ? స్థిర మరియు చర వ్యయాల మధ్య భేదాల్ని వివరింపుము.

2. Explain and illustrate diagramatically the equilibrium of firm and industry in the short run under perfect competition.
స్వల్పకాలంలో సంపూర్ణ పోటీలోనున్న సంస్థ మరియు పరిశ్రమ సమతౌల్యాన్ని పటం సహాయంతో వివరింపుము.

3. What is meant by monopoly price discrimination? State the conditions for price discrimination.
ఏకస్వామ్య ధర విచక్షణ అనగా నేమి ? ధర విచక్షణకు అవసరమైన నిబంధనలను (షరతులను) వివరింపుము.

II. Answer the following questions in about 15 lines each.
క్రింది ప్రశ్నలకు సుమారు 15 పంక్తులలో జవాబులు వ్రాయుము.

1. Explain important objectives of firm.
సంస్థ యొక్క ముఖ్యమైన లక్ష్యాలను వివరింపుము.

2. How is price determined in simple monopoly ?
సాధారణ ఏకస్వామ్యంలో ధర ఏ విధంగా నిర్ణయింప బడుతుందో వివరింపుము.

3. What is monopolistic competition ? What are its characteristics ?
ఏకస్వామ్య పోటీ అనగా నేమి ? దాని లక్షణాలేవి ?

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UNDERGRADUATE COURSE II YEAR

SUBJECT : **ECONOMICS**

COURSE - I : ANALYTICAL ECONOMICS

ASSIGNMENT NO. 3

Note : 1. Do not copy the answer directly from any of the books.
2. As far as possibly try to answer the question independently in your own words.
3. If it is necessary to quote from any source give the correct reference.
4. Use your own foolscap pages for writing the assignments.
5. Leave sufficient margins for the comments of the evaluator.
6. Completion of this assignment normally should not take more than two hours' time.

I. Answer the following questions in about 30 lines each.
క్రింది ప్రశ్నలకు సుమారు 30 పంక్తులలో జవాబులిమ్ము.

1. Summarise the views of Classical Economists on the theory of employment.
ఉద్యోగితా సిద్ధాంతంపై సాంప్రదాయ అర్థశాస్త్రవేత్తల అభిప్రాయాలను సంక్షిప్తీకరించుము.

2. What is consumption function ? Explain the factors affecting consumption function.
వినియోగ ఫలం అనగానేమి ? వినియోగ ఫలంను ప్రభావపరుచు కారకాలను వివరింపుము.

3. Explain the integration of money market and [illegible] market with the help of 'IS' & 'LM' curve.
'IS' మరియు 'LM' రేఖల సహాయంతో ద్రవ్య మరియు వస్తు మార్కెట్ల సమైక్యత/సంలీనత/ఐక్యీకరణను వివరింపుము.

II. Answer the following questions in about 15 lines each.
క్రింది ప్రశ్నలకు సుమారు 15 పంక్తులలో జవాబులు వ్రాయుము.

1. Explain the concepts :
(a) Neutrality of money (b) laissez-faire.
తటస్థ ద్రవ్యం (ద్రవ్య తటస్థత), స్వేచ్ఛా వ్యాపార విధానం అను భావనలను వివరింపుము.

2. What is meant by effective demand? What are its components ?
సార్థక డిమాండ్ అనగా నేమి ? సార్థక డిమాండ్‌లోని భాగాలేవి ?

3. Explain the concepts of multiplier and accelator.
గుణకం, వేగ త్వరణం అను భావనలను వివరింపుము.

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