PERIYAR INSTITUTE OF DISTANCE EDUCATION (PRIDE)

PERIYAR UNIVERSITY

SALEM - 636 011.

B.B.A. BANKING

FIRST YEAR

PAPER – I : PRINCIPLES OF ECONOMICS

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UNIT – I

DEFINITIONS AND SCOPE OF ECONOMICS

Adam Smith's Definition (Wealth Definition)

Adam Smith (1723 - 1790) of Scotland is regarded as the Father of political Economy. His book "An Inquiry into the Nature and causes of the Wealth of Nations" is considered to be a monumental work in Economics. In his book, Adam Smith defined economics as the Science of wealth. According to him, Economics lays down the principles to make the people and the Sovereign rich. The science provides ways and means of getting plentiful revenue to the State and more property to the people. Almost all classical economists defined the subject in a similar way. Wealth according to early writers means material and tangible goods only.

The definition of Adam Smith was not appreciated by the people at that time. The strong hold of religion and Church which taught puritanical views and simple living made the people to misunderstand the 'wealth definition'. The term wealth was mistaken to be 'money'. This gave rise to serious misunderstanding of the nature of economics. Eminent people and writers like Carlyle and Ruskin strongly criticised this science. They condemned economics as the science of 'ilith' and not 'wealth', as it taught love of money. This science was ridiculed as a 'dismal science' and also 'bastard science, the science of getting rich', as it emphasised 'wealth' ignoring Man.

The main defects of Wealth definition are as follows:

(a) The definition had taken a very narrow view of wealth. According to the definition, Wealth denotes earning and spending of money. This had given a wrong impression about the true nature of economics. It looks as Economics makes Man to be selfish and mean.

(b) The definition is incomplete. It gives an impression that human wants are satisfied only through earning and spending of money. A man gets satisfaction not only through earning and spending, but also through other activities like, singing, dancing and playing. These activities have economic aspects involving choice and satisfaction of human wants. According to Wealth definition, these are outside the scope of economics.

(c) The emphasis on 'wealth' neglects Man altogether. Wealth is made for Man and not Man for wealth. The wealth definition gives an impression that 'wealth' is the end of all human activities. It is not so. Wealth is only a means to an end and not an end in itself. Moreover, it is possible to think of ultimate objectives which are not concerned with wealth.

The wealth definition was considered to be unscientific and incomplete. Therefore this definition was rejected.

Marshal Definition

'Alfred Marshall, the great English economist, was influenced by the criticisms leveled against the classical school of economics and many important changes which had occurred in economic life. He therefore, forced to make

fundamental changes in the traditional concepts. He posed for himself two basic questions:'

(a) Why should there be poverty, misery and want while there has been such an increase in material wealth

(b) Was it possible to abolish poverty, or at least reduce it?

Marshall considered economics as a means or an instrument to better the conditions of human life. He defined economics thus "Political Economy or economics is a study of manking 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." According to Marshall, Economics deals with man's day life, of his work and of his income and expenditure.

While earlier writers emphasized wealth, Marshall emphasized both man and wealth. Economics is a study of man in the ordinary business of life." It is on this aspect "a study of mankind" that Marshall placed primary emphasis. At the same time economics should be concerned with wealth which constituted the material requisites of well-being." By 'wealth' is meant for all things, "mainly material which provides the means for existence, comfort and enjoyment. But wealth is not considered as an end in itself but as a means to welfare, as a 'source of the betterment of the human lot." Marshall consciously and specifically limited the scope of economics. According to him economics studies only those activities which are most closely related to wealth or those "most closely connected with the attainment with the use of material requisites of well-being." Marshall's definition of Economics has come to be known as welfare definition. Marshall's concept of economics as the study of wealth and welfare was accepted by his illustrious students and disciples. Pigou, Marshall's well-known disciple, defined economics as a study of economic welfare which is "that part of welfare which can be bought directly or indirectly with the measuring rod of money". This definition extends the scope of economics to cover all goods, material or non-material, which command a money price and takes in the whole of the price system.

Criticism of Welfare Definitions

The "material welfare" definitions of Marshall, Pigou and others were accepted widely and were thought we have put an end to all controversies regarding the subject-matter of Economics. The controversy was revived' by Lionel Robbins who criticised the welfare definitions of economics as classificatory.. Marshall, for example, classifies human activities into economic and non-economic activities. Economic activities are those which are related to wealth and are measurable with the help of money. Non-economic' activities refer to political, social, religious and such of activities which are not strictly related to wealth or to the measuring rod of money. Marshall and Pigou considered economics to be the study of only those activities which are most "closely connected with the attainment and with the use of the material requisites of well-being." According to Robbins, the distinction between economic and non-economic activities is not valid, since all human activities

are essentially economic. An economic problem will arise whenever and wherever scarce means, such as, time and money, are involved in the satisfaction of certain ends.

Lionel Robbins Definition (Scarcity Definition)

Prof. Lionel Robbins of the London School of Economics constructed a new definition of economics in 1932 in his book, 'The Nature and Significance of Economic Science'. He defines economics as a "science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."

This definition is based on certain observations and propositions by Robbins.

In spite of its scientific approach, universality and unambiguity, Robbins' definition is criticised on several grounds.

1. **The definition reduces economics to the theory of value, lacking human touch:** An analysis of 'scarcity' of means and 'multiple ends' logically leads to the discussion of 'supply' and 'demand' in the economy and the theory of pricing. It is true that pricing and equilibrium analysis form the core of economics, but these alone do not form the whole of economic life. If economics is reduced to the study of product-pricing and factor-pricing, it becomes not only dull and drab, but also colourless, lacking the human touch. This again gives room for condemning economics as bread-and-butter science.
2. **Economics is not entirely a positive science:** This is the most adverse criticism against Robbins' definition. Many economists on 'welfare' Line of thought, view that economics cannot be neutral between 'ends', if it is to serve social betterment. Economists would have to tell what is good or bad for the progress and welfare, and what steps should be taken to achieve some ends. Modern economists view that economics should be both positive and normative, and it should not only 'describe' but also 'prescribe'. Hence Prof. Thomas has rightly pointed out that "the function of the economists is not only to explain and explore, but also to educate and condemn" Economics should offer solutions to practical problems for the welfare of mankind.
3. **The welfare concept can also be traced in Robbins' definition:** Although Robbins had decried the 'welfare' of Marshall and affirmed that economics has nothing to do with welfare or ilifare, he had allowed the welfare concept to enter his scarcity definition through the back door. According to Robbins, the scarce means are to be adjusted and utilized to the multiple ends in such a manner as to secure maximum utility, or satisfaction. The individual by his rational behaviour tries to maximise his satisfaction or welfare. The head of the family tries to increase the welfare or satisfaction of the family by judiciously allocating the little 'income' to various 'needs' of the family. So also, the State tries to increase the welfare of the citizens by affording many amenities to people

with the resources at the disposal of the Government. In all these cases, maximum satisfaction or utility is aimed at with limited resources. If 'maximum satisfaction' is not interpreted as 'increasing welfare', what else could it be interpreted as?

4. **'Means' and 'Ends' are not separable:** Scarcity definition deals too much with 'means' and does not contemplate anything about 'ends'. The definition assumes that 'means' and 'ends' are separable having separate entities. In practical life it is not so. It has been pointed out by critics that in practice 'ends' are as important as the 'means'. Further, 'ends' of to-day will become the 'means' of tomorrow. After all, the 'means' in the economy are only 'ends' of earlier actions. Neglecting the study of 'ends' by giving undue importance to 'means' in Robbins definition makes it not only illogical, but also highly artificial. Both are inseparable and are equally important in economic study.

5. **Economic problems 'will arise not only due to scarcity but also due to plenty:** Robbins has categorically assumed that economic problems arise due to scarcity alone, without taking into consideration that it may arise due to abundance also. During the period of the 'Great Depression' of the thirties, the problem was not scarcity, but abundance of goods, i.e., over-production. The capitalistic countries of the world had to face falling prices, unemployment and other miseries of depression. Further, in industrially developed countries like U.S.A., the problem confronting the society is not 'scarcity', but 'affluence'. Due to rapid economic development and growth, these countries have become very rich and the citizens enjoy high standard of living and enormous luxury. This unprecedented affluence has created many problems in these economies. The problem of mental tensions, optimum use of leisure, 'quick-living' etc., confront the economists and they have to think in terms of "beyond economic growth". Prof. Gaibraith has put forward these points in his book. "The Affluent Society and states that scarcity" and poverty had become outdated in his country, though it may be the lot of many countries of the world. According to him, the conventional economic data and wisdom are inadequate to his country, as the problem changed from scarcity to affluence and from poverty to prosperity.

6. **The definition is too narrow and Macro Economics does not come into the fold of our study:** The Scarcity definition is too narrow and inadequate to modem economic studies. Mere study of allocation of resources and pricing of products and factors confines economics to a narrow cell, and many modem economic problems fall outside the scope of Robbins definition. Recently, a separate branch of economic study has taken root. This has come to be known as 'Macro Economics' in which the problem of the economy as a whole is discussed. National Income, Employment Theory, Problems of Labour, and Problems of Business Cycles, etc., which come under Macro Economics are outside the scope of Robbins' definition. In this respect this definition is static.

Scope of Economics

The scope of economics means the limits of its subject matter. From the definition we can understand the scope of economics. It studies man in the ordinary business of life and how he earns his income and how he satisfies his wants. It is concerned not with individual actions but with social actions. It studies how wealth is produced with limited resources in order to satisfy human wants. It studies about problems arising out of multiplicity of wants and scarcity of resources which satisfy these wants. It studies how wealth is produced, consumed, exchanged and distributed.

Satisfaction of human wants is called Consumption which forms one of the important branches of economics. This tells how people behave in consumption of goods and services in order to maximise their satisfaction. Goods and services have to be produced with the help of factors of production. So, Production is another important branch of economics. This tells how maximum goods are produced with minimum cost or how the scarce factors could be utilised economically for better results. Goods and services cannot be produced at one place or at one point of time. Goods produced by one are exchanged for the goods produced by the other. So, Exchange forms another important branch of economics. Goods and services are produced with efforts, i.e., by combining the factors of production. These efforts have to be paid for or rewarded. The land gets rent, the labour gets wages, the capital gets interest and the organizer gets profit. This branch of study is called Distribution.

Besides these four branches, there is another important branch called Public Finance. This studies about the sources of revenue to the government and the principle governing expenditure for the benefit of the people. It studies about public debt and financial administration.

Economics: Positive or Normative Science

A discussion on the nature of economic analysis leads us to the controversial problem, viz., should economic analysis "be positive or normative. This dispute is as old as economics itself. The old English classical school held that Economics was purely a positive science and economists had no right to comment upon the ethical aspect of economic phenomena. But the Historical School of Germany held the opposite view and affirmed that Economics should not consider itself apart from ethical considerations.

In order to understand this controversy, we should know the meaning and significance of the two terms 'positive' and 'normative'. According to J.M. Keynes, "A positive science .may be defined as a body of systematized knowledge concerning 'what is'; a normative science or regulative science is a body of systematized knowledge relating the criteria of 'what ought to be', and concerned with the 'ideal' as distinguished from the actual". Explaining further, Keynes says that the object of positive science is the establishment of uniformities and the object of a normative science is the determination of ideals. Positive science deals' with things as they are, and it simply explains causes and effects without passing any moral judgement or comment on the desirability of having certain ends. In short, positive, science remains neutral

between ends. But normative science deals with things as they 'ought to be'. It discusses the moral rightness or otherwise of the end result.

According to Watson, the distinction between positive and normative science is akin to the difference between 'pure science' and 'applied science'. "When it (Economics) confines itself to statements about causes and their effects and to statement of functional relation, theory is said to be positive. When, in contrast, it embraces norms and standards, mixing them with cause-effect analyses, theory is said to be normative". For example, if we analyse, the causes for the question, what determines the rate of interest, it is a positive enquiry and we analyse and discuss conditions as they are without mixing any moral or ethical considerations. Suppose, the question is what should be a fair rate of interest. This is a normative enquiry in which we have to analyse things as they should be. In deciding a fair rate of interest we have to bring in ethical considerations.

"Positive statements, assertions or theories may be simple or they may be very complex but they are basically about what 'is' the cause. The disagreements over positive statements are appropriately handled by an appeal to the facts. Normative statements concern what ought to be. They depend upon our judgments about what is good and what is bad; they are thus inextricably bound up with our philosophical, cultural and religious positions."

Normative statements mainly depend on 'Value Judgements' and consequently there is a lot of scope for disagreement as the ideas of good and bad not only become subjective but also varied in concerts. According to Lipsey, "Disagreement over normative statements cannot he settled merely by an appeal to facts"

Another important distinction between positive and normative statements is that it is logically impossible to deduce normative statements from positive assumptions and vice-versa.

With the advent of Robinson approach to the problems of economics, positivism began to take a stronger hold on economic science and the 'positivists' put forth the following arguments to treat economics purely positive.

(i) 'Positive study' is combined with 'normative thinking' in economics, economic study will be hampered as much as there will be a lot of confusion in inquiries. The foundation of study would not be secure if 'what is' and 'what ought to be' are linked up in inquires and discussions.

(ii) The progress of this science would be gravely hindered if strictly positive approach is not made. In positive approach, as it is based on facts and inquiries regarding 'what is', there may not be much disagreement. If enquiry becomes normative (i.e., what ought to be) there can be vast scope for disagreement. Ethical consideration, if allowed to invade the realms of economics, would end in perpetual disagreement.

(iii) Intrusion of ethics in Economics would land the economists in an awkward position. His task, every Lime, would become arduous and

cumbersome as be may have to pronounce ethical judgement on his findings. This will lead to misunderstanding of economists.

(iv) Combining 'positive' and 'normative' inquires would lead to combining 'theory' with 'practice' or 'theorem' with the 'maxim'. The public is likely to be misguided and misinterpreted. When a pure theory is formulated by an economist, it is likely to misinterpreted as a practical solution.

'Positive Economics' finds advocates in N. senior, J.S.Mill and Lionel Mill and Lionel Robbins. Senior for instance said, "An economist is not authorized to add even a single word of advice".

There are equally large number of economists who advocate normative functions to Economics. Hawtrey, Fraser, Wolfe and Paul Streeton put forward well-fortified arguments for normatism. Mahatma Gandhi finds that ethics could not be dissociated from Economics. Alfred Marshall and his followers firmly believed that economics and ethics are intertwined. They are not for treating economics purely as a value theory of equilibrium analysis. Mrs. Barbara Wooton points out that "It is very difficult for economists to divest their discussions completely of all normative significance". Paul Streeton has made a concluding remark that "Economists cannot and should not refrain from making value judgements if their studies are to be more than a purely formal technique of reasoning, an algebra of choice".

Micro and Macro-Economics

The terms "micro-economics" and "macro-economics" were first used by the Swedish economist Ragnar Frisch in the 1920s. Micro-economics is the study of the particular, of individuals, households, firms, and industries, or of individual prices, wages or incomes. It studies the economic motives and behaviour patterns of individual consumers and producers and the principles involved in organising and operating individual business firms or industries, Macro-economics, on the other hand, is the study of the economic system as a whole, of the aggregate national income, of the aggregate consumption and demand and of the aggregate saving, investment and employment in the system. It deals with the great aggregates and averages of the system rather than with particular items in it.

Micro-economics studies the manner in which the prices of individual commodities and services are determined. It explains how and in what manner the price of a commodity, its production and consumption fluctuate. Macro-economics, on the other hand, studies the manner in which the total employment; production and the relative shares of various productive agents in such production are determined. It enables us to understand how and why total employment, total output and the earnings of various categories of producers vary from time to time. Micro-economics studies the particular aspects of an economy, while macro-economics studies the general aspects of an economy.

Evolution of the Two Analyses

From the beginning, the term economics was understood to mean macro-economics, i.e., dealing with the entire economic system and not with any particular problem or segment of the economy. Mercantalist who were the first school of economic thought made a "contribution to statecraft, which is concerned with the economic system as a whole and securing the optimum employment of the systems entire resource." Adam Smith, the founder, of the English classical school, studied the nature and causes of the wealth of nations. He assumed full employment and aggregate output in the economy as given and believed in an "invisible hand" which managed the whole economic system in systematic manner. On the basis of their theory of "self interest" Adam Smith and his followers explained how various factors were combined; how particular goods were produced; and how the value of the final product was determined and later distributed between the different factors of production. Since the economy would function smoothly and perfectly by itself, the economist is not so much concerned with the study of the economy as a whole. Instead, he is interested in the study of the particular sections of the economy like consumption of households and production of particular industries. It was Adam Smith who paved the way for micro-economic analysis.

Even in the 19th century, the classical approach was violently criticised. T.R. Malthus, well known his theory of population, and Karl Marx, the father of communism, did not agree with the classical thesis of a self-adjusting economy based on self-interest and harmony of class interest. They also denied the existence of the invisible hand which ran an economy smoothly. Malthus was the first to point out that aggregate demand might prove insufficient to absorb all production. Malthus' theory of market gluts based upon the fact of under-consumption became the forerunner of Keynes' General 'Theory. Malthus can be considered the founder of modern macro-economic analysis. Later, Karl Marx made an attempt to deal with the problems of the whole economic system and build a general picture of economic life and relationships. However, economists, in general, ignored macro analysis in that time.

The neo-classical writers, of whom Alfred Marshall was the most famous, concerned themselves so much with micro-economic analysis that they completely neglected the macro-economic elements of the earlier writers and also of the writings of Malthus and Marx. They developed macro-analysis to near-perfection. Stray attempts were, however, made to bring in macro-economic analysis by some classical but without much success. In fact, as long as the economic system functioned progressively and smooth economists naturally took the economy as a whole for granted, and thus studied the determination of individual prices and quantities rather than the determination of general prices, output and employment.

The development of macro-economic analysis started in the thirties of this century, with the outset of the Great Depression (1929-33). During this period, all the countries of the world (with the lone exception of the USSR) suffered from a severe fall in prices, incomes and employment. The classical

assumption of automatic full-employment was shattered. Keynes pointed out that a full employment volume of total output brought into existence and maintained by' self-interest need not exist under all circumstances. Hence, he studied the forces on which the scale of output and volume of employment depended in, an economy. The study of the entire system assumed great importance. Keynes did not say that micro-economic analysis was wrong or objectionable but only pointed out the basic of its assumptions. Besides Keynes, Leon Welras, Knut Wicksell and Irving Fisher were among the prominent modern writers who contributed to the development of macro-economic analysis.'

Limitations of Micro-analysis

Micro-economic analysis is extremely useful and necessary but it has two limitations. In the first place, it does not give us a correct overall picture of the working of the economy because it concentrates on the working of the component parts of an economy to the exclusion. An economic policy which is applicable for a group or a region may not apply for the whole economy.

Weaknesses of Macro-analysis

Of the many pitfalls into which macro-economics in liable to fall, the first is that it generalise the reasoning and conclusions derived from micro-analysis. Many things can be done by individuals without any difficulty and without any adverse consequences but the same may lead to disastrous consequences if attempted by all. For instance, individual depositors can withdraw their funds from a bank whenever they like, but if all depositors do so simultaneously the bank will collapse. It was Keynes who made the now famous statement that while saving by individuals is a virtue, saving by the community may prove a calamity. Through saving, individuals accumulate wealth. But if the community decides to save more by spending less, production will decline, income will become less and employment will come down. To generalize from individual experience is, therefore, one of the greatest dangers which macro-economic theory should avoid.

Macro economic analysis is apt to ignore the differences which may exist within aggregates or groups. 'The general price Level in India the average of many prices may have been steady between, say 1960 and 1970. We may be tempted to conclude that the distribution of income between different sections, viz., agriculturists, traders, workers, consumers, etc., was also constant. But this conclusion would be wrong since agricultural prices may have fallen during this period. The decline in agricultural prices may not be noticeable if it has been or compensated by fluctuations in the opposite direction in industrial prices. As a result of the fall in agricultural price, the agriculturists may have lost in money as well as in real income, while producers of industrial goods and middlemen might have actually gained. It is, therefore, essential to keep in mind the nature, composition and structure of different groups when we make a statement regarding the system or aggregate on the assumption that it is homogeneous.

The aggregates which compose a system may not be significant or interesting. To illustrate this point; the "general price level" in a country—which is an aggregate—includes all types of prices, wholesale and retail prices of different goods, and prices of productive agents, viz., wages, interest, profits and rent. Some prices move very fast, as example, prices of securities while others are extremely rigid as, for instance, house rent. Some prices move in one direction, move in one direction, while others may move in the opposite direction. When these various prices are joined together to make up the general price level in the country, we get nothing but a hotch potch while lacks precise meaning.

Finally, it is important to emphasise the fact that the structure of the aggregate or the component parts may be more important than the aggregate itself. For this, the aggregate should be broken into its component parts and the importance of this composition should be recognised.

Relationship between Micro and Macro Economics

The strong interdependence between Macro and Micro Economics arises due to several reasons. Firstly, the tools of micro economic analysis help to understand a wide range of problems relating to the whole economy. For example the psychological law of consumption function is based upon individual consumer behaviour. We get social investment function by adding up investment function of different firms. Thus several important macro theories about the behaviour of macro aggregates are based on theories of individual behaviour.

Secondly, Micro Economics makes a positive contribution to Macro Economics in another way. For example if we want to control inflation, we should try to avoid a rise in the cost of production of different firms. This requires a control over the cost of raw materials and wages. Also individual firms should increase productivity. These are micro level issues.

Just as micro Economics provides the foundation for macro economic theories, Macro Economics also provides the basis for micro economic theories, for example we study they the rate of interest and profit, in Micro Economics. Macro Economics tells us that aggregate saving and aggregate investment determine interest. Similarly Micro Economics studies changes in profits but does not explain the reason. Macro Economics explains that profits fluctuate during the stages of business cycles.

Thus there is strong interdependence between Micro Economics and Macro Economics. Gardner Ackley says that the relationship between Macro Economics and Micro Economics is like a two way street. On the one hand Micro Economic theory should provide the building blocks for our aggregate theories. But macro Economics also contributes to micro economic understanding. To quote Paul Samuelson, "there is really no opposition between Micro and Macro Economics. Both are absolutely vital. And you are only half-educated if you understand the one while being ignorant of the other".

Nature of Economic Laws

Every science uses terms such as hypothesis, theory and law. We have a tentative hypothesis when we attempt to explain a group of acts. If the hypothesis can explain new facts and is not contradicted by new discoveries, it may be promoted to the rank of a theory. If a theory continues to stand the test of time and experience, a law may be exactness of its laws and generalizations. The aim of economic, like all other sciences, is to obtain generalizations or principles or laws, which would help us to understand the past and offer trustworthy guidance for the future.

What then is a law? A law, in the context of any science, is a statement of causal relationship between two sets of phenomena, one as cause and the other as effect. Every cause has a tendency to produce some definite result, if nothing happens to prevent it. Things fall to the ground as a result of the force of gravity, if nothing interferes to prevent them from falling. This is the law of gravity. A fall in price will induce people to buy more of a commodity. This is the law of principles expressing what is likely to happen, other thing, being equal Marshall writes: " A law of social science, or a Social Law, is a statement of social tendencies, that is, a statement that a certain course of action may be expected under certain conditions from members of a social group. Economic laws, or statements of economic tendencies, are those social laws which relate to branches of conduct in which the strength of the motives chiefly concerned can be measured by a money price.

Economic laws are concerned with the relations of men in their dealings with wealth or economic goods. They describe the normal actions of individuals, though men cannot always be relied upon to act in the ways suggested. The phrase 'other thing being equal' indicates the limitation within which many, if not all, economic laws operate. Human nature is variable and inconsistent; hence economics can only state the normal reaction, but cannot with certainly, say that this reaction will occur in a given situation.

Natural sciences usually claim to be able to lay down precise laws. The law of gravity is an exact statement and it is used for many mathematical calculations regarding stars and other celestial bodies. There are no economic laws which are as accurate, precise and of universal validity, as the law of gravitation. The laws of economics are hypothetical or conditional in the sense that the relation between cause and effect is subject to the condition that other things are equal. But then, every scientific law does contain conditions or the provision, other things being equal" more often in economics than elsewhere. In a sense, all scientific laws are hypothetical but economic laws are more so.

There are many factors which explain the hypothetical nature of economic laws. The operation of economic laws may be prevented or modified by the vagaries of human nature. Nature, on the other hand, will reproduce itself every time, everywhere. Besides, many economic laws are subject to the influence of a variety or multiplicity of causes. An economic phenomenon may be subject to more than one law at a time. Take, for example, the price of any commodity or service; it depends upon two laws- the law of demand and the

law of supply-each act in an absolutely different manner. Suppose that the demand for a Commodity rises we may expect its price to rise. But this may or may not happen; the price may rise if the supply remains the same; but if the supply contracts, the rise in price may be far more than anticipated on the basis of increase in demand. If, however, the supply increases, the increase in demand may be neutralised. Thus, the effects of one principle may be counteracted by another. Such a multiplicity of causes may also be found at work in the physical sciences though it is comparatively easier to isolate causes and effects in physical sciences.

Marshall has pointed to another difficulty in economics, viz., that time must be allowed for causes to produce their effects. But when time is allowed, the material on which they work and perhaps the causes themselves may have changed. Either the anticipated effect may not come into existence at all or may appear only partially.

NOTES

UNIT – II

THEORY OF CONSUMER BEHAVIOUR

Demand and supply

Demand Analysis

Meaning of Demand

In the ordinary Language, we use the term 'demand' to express our desire for a commodity. But in economics, mere desire should not be called as demand. A pauper may desire a motor car. The seller of motor cars is in no way affected by this desire. The desire for a commodity should be backed by necessary purchasing power (money). Further, the person should have the willingness to purchases the commodity. Demand for a commodity arises from the following factors:

(a) Desire for the commodity, (b) Ability to pay the price for the commodity and (c) Willingness to pay the price.

Therefore, demand is defined as "a desire for a commodity backed by willingness and ability to pay a price". It is always better to state this demand as 'effective demand' to show that consumers are ready to purchase the commodity.

Further, demand is always related to a price. There is no meaning in saying that the demand for butter is very high in Chennai. The demand should be always expressed in terms of quantity at a particular price. Moreover, the demand changes with time, say, a day, week, month or year depending upon the nature of the commodity. For example, the demand for butter in Chennai city is said to be 1200 quintals per day at a price of Rs.60 per kg: The demand for scooters in Bangalore city is said to be 3000 per year at a price Rs.15,000.

The demand for a commodity is a schedule of the quantities that consumers would be willing to buy at different prices at any one instance of time. For an individual consumer, demand refers to the various quantities of the commodity which would be purchased by the consumer at different prices at a particular time.

Demand Schedules and Demand Curves

Demand schedule is a table or statement showing how much of a commodity is demanded (purchased) in a particular market at a different prices. A demand schedule is one of Alfred Marshall's contribution to the techniques of price theory. It is a list of prices and quantities. According to Benham, a full account of the demand for goods in a given market at a given time should state what the (weekly) volume of sales would be at each of a series of prices. Such an account, raking the form of a tabular statement, is known as a demand schedule. A demand schedule thus states the relationship between the price and quantity demanded. Though demand for a thing depends upon many influences, a demand schedule is drawn up on the assumption that all these other influences remain unchanged. It thus attempts to isolate the influence exerted by the price of the goods upon the amount of it sold. A demand schedule may be an individual demand schedule or a market demand schedule. The former

tells the quantities demanded by an individual consumer at different prices, while the latter tells about the quantities demanded in a market at different prices. A market will consist of a lot of buyers. Market demand schedule is nothing but the sum total of individual demand schedules.

We can understand better the concept of demand schedules of market or individual consumer by giving examples. The following is an imaginary demand schedule of a consumer of butter.

Table 7.1

Individual demand schedule for butter

Price of butter per kg. in Rupees	Quantity of butter demanded in kgs. per month
60	1
54	2
48	3
45	4
36	5
30	6

It is clear from the schedule that when the price of butter is at Rs.60, our imaginary consumer demands just one kg. when the price falls to Rs.48, he had a demand for 3 kgs., and when the price falls still further to Rs.30 he could demand 6 kgs.

Market Demand Schedule

As we know, a demand schedule for market can be constructed by adding up demand schedules of the consumers in the market. It may be argued that the demand schedules of different consumers show so many variations and peculiarities that to prepare a demand schedule for the whole market (where there may be hundreds of purchasers) is a sheer impossibility. But in practice it is not so difficult. Marshall observes, "In large markets the peculiarities in the wants of the individuals will compensate one another in a comparatively regular gradation of total demand. Every fall, however slight, in the price of a commodity in general use will, other things being equal, increase the total sales of it just as unhealthy autumn increases the mortality of a large town, though many persons are uninjured by it". Thus if we have the requisite knowledge, it should be possible for us to make a list of prices at which each amount of it will find purchases in a given market during a period, say, a month. Given below is an imaginary market demand schedule for butter in Chennai for a month.

TABLE 7.2

Market Demand Schedule for Butter in Chennai

(Census Method)

Price of Butter per kg. in Rs.	Consumers Individual Demand A,B,C,D…..n	Total Quantity Demanded in Kgs. per month
60	a b c d …….. n	20,000
54	e f g h …… j	25,000
48	k l m n …… p	30,000
42	q r s t ……. u	35,000
36	v w x y ……. z	40,000
30	$a_1b_1c_1d_1$	50,000

There is another method of framing the market demand schedule. As it is very difficult to add up the demand schedules of all persons in the market to arrive at a total market demand, the demand schedule of a typical or average consumer is taken up as the representative consumer schedule. Then the quantity demanded by their representative consumer is multiplied by the number of consumers in the market demanding the, commodity and there by we can arrive at market demand. Given below is the market demand based on the typical representative consumer. The number of consumers in the market demanding butter is assumed to be 10,000.

Price of Butter per kg. in Rs.	Demand of the typical Representative Consumer in Kgs.	Number of Consumers in the market	Market Demand per month in kgs.
60	2	10,000	20,000
54	2.5	"	25,000
48	3	"	30,000
42	3.5	"	35,000
36	4	"	40,000
30	5	"	50,000

With the help of demand schedules we can construct demand curves. In fact demand curves are only graphical representation of demand schedule. The relation between the price and the amount bought can be plotted on a diagram as a demand curve; it is usual to measure quantity on X axis and price on Y axis.

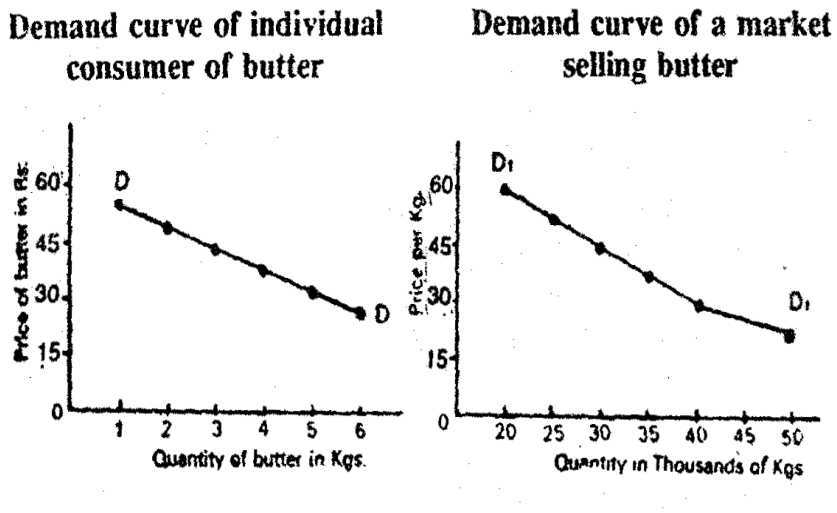
Demand Curves may be of any type. It may be of a straight line, or a convex curve or a concave curve, or partly one and partly another. Most actual demand curves are squiggles rather than straight lines. The imaginary demand curves based on the imaginary schedules given in books will be a smooth

descending curve or straight line. But realistic curves drawn by taking up the actual investigation in the market will not be so smooth or of such a perfect geometrical shape. The only feature that is common to nearly all demand curves whether practical or imaginary is that, whatever their shape may be, they always slope downwards to the right indicating that more quantities will be bought at a lower price than at a higher price, other conditions of demand remaining the same. The demand curves based on the individual schedule and the market schedule are given below:

An imaginary schedule and smooth curves and straight lines are given in text books to illustrate the demand curve, far from the realistic example, because of the simple reason, that the concepts connected with demand cannot be conveniently defined and discussed without confusion. If we take realistic curve, it would fail to illustrate the number of concepts on hand. Secondly a realistic example has not been chosen as it is impossible to say what demand would be at a whole series of prices, some of which would necessarily be at some distance from the prevailing market price. No one would presume to suggest to what extent demand would be affected, if for instance, prices were double what they actually are.

In addition to individual consumer demand curve and the market demand curve given already, there are two other demand curves. They are (i) Seller's Average revenue curve and (ii) Aggregate demand curve. The seller's average revenue curve indicates how much a seller can sell his product in a market at different prices. Of course this is the demand curve of the product in the market with reference to a particular seller. The aggregate demand curve indicates the quantities of all goods taken

FIGURE 7.1



together, which will be bought in the country at different levels of national income. This curve relates to 'Aggregate Demand' of the economy. The law of demand which we are going to study is applicable to only individual and market demand curves and also seller's average revenue curve. It does not

apply to 'Aggregate Demand curve'. Only those curves, (individual, market and sellers average revenue curves) which are subjected to the operation of the law of demand will slope downwards from left to right. The aggregate demand curve is entirely in a different category and it will not slope downwards.

Law of Demand

The Law of Demand indicates the relationship between the price of a commodity and the quantity demanded in the market. It may be stated as follows when other things being equal, the quantity demanded extends with a fall in price and contracts with a rise in price. That is to say, the quantity demanded varies inversely with the price. In simple language it means that a person will purchase more of a commodity when its price falls and he will purchase more of it; when its price rises. Therefore, the greater the amount to be sold, the lower must be the price to attract purchasers.

Marshall defines the law 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". This law rests upon the firm logic. The law tells the direction of change in demand with change in price". It does not contemplate about the quantity of change.

'Other things being equal' is a very important qualifying phrase in the law. Larger demand at lower prices and smaller demand at higher prices for a commodity depends on certain static conditions assumed. This leads us to the consideration of those factors which could affect the demand. Besides prices, the following factors could influence the demand of a commodity.

Factors Influencing Demand: Demand Determinants:

(1) The first factor is the number of consumers in the market demanding the commodity. Larger the number of consumers, the larger will be the demand for that commodity. But the number of consumers will depend upon the size of population.

(2) Demand depends on the level of income and wealth of the consumers. A rise in income and wealth of consumers will push up the demand while a decline in the levels of income and wealth will push down demand.

(3) The third factor influencing demand refers to tastes, preferences, customs, habits of consumers. If these change, demand will also change. Tastes and preferences will have full play in fancy goods and fashion articles. Tastes and preferences are created or changed by continuous advertisement through various media.

(4) Existence of substitutes for a commodity will affect the demand of the commodity. It there are many substitutes for commodity X, the demand will get divided. Apart from a number 'of substitutes, the prices 'of substitutes should also be taken 'into' consideration. The demand for 'Coffee' will depend upon the price of 'Ten' which 'is a substitute for coffee. If the price of coffee, is high, the demand for coffee will come

down and consequently the demand for tea will go up even though there may not be any change in the price of tea.

(5) The next factor on which the demands is the expectation of the consumer out the future. If consumers anticipate changes m supply conditions or prices, the demand for that commodity will also change.

(6) The commodity in question, should not have any 'Prestige value' or 'Status symbo1' like diamonds, articles of jewellery, etc

(7) The demand may change due to changes of weather. Demand for cool drinks, ice-cream etc., will go up during summer and fall down in winter and demand for umbrella will go up during the rainy season.

Thus, there are many factors affecting the demand, independent of the prices of commodities. The Law of Demand will be operative in a market only if the above things remain unchanged. A change in any one of the factors will render the law inoperative in the market.

In general, the demand function for a commodity can be stated as:

$$Q = f (P, Y, PR, W)$$

where P stands for price, Y for income, PR prices of related goods and W for wants or tastes. The main determinants of demand are price of that commodity, prices of other related goods, income of the consumers and their tastes, etc. If all other things are kept constant, demand will be the function of price.

Three Types of Demand

Consumers demand of a commodity or a service may refer to the various quantities of a given commodity or service which consumers would buy in a market in a given period of time at various incomes, or at various incomes or at various prices of related goods. Three kinds of demand may therefore be distinguished based on these three factors. They are Price Demand, Income Demand and Cross Demand.

1. **Price Demand:** Price Demand refers to various quantities of a commodity or service that a consumer would purchase at a given time at different prices n a market. It is assumed that other things like the income of the consumer, prices of the related goods, remain the same.

2. **Income Demand:** Income Demand refers to the different quantities of commodities will buy at different levels of income, other things remaining the same ie.,the price of the commodity, preference should be static.

3. **Cross Demand:** Cross demand refers to the quantities of a commodity or service which will be purchased with reference to changes, not of that particular commodity, but of other inter-related commodities, when other things remaining the same. It may be defined as the quantities of goods that consumers buy per unit of time at different prices of a 'related' article. The assumption is that the income of the consumer and also the price of the commodity in question will remain constant. For example, if there is a rise in price of coffee, people will demand tea and

consequently the demand for tea will increase, though the price of tea remains constant and the income of the consumers remains constant. The price effect in one commodity will have a reaction on the other related commodities.

3. Reasons behind Downward Slope of the Demand Curve

The demand curve obeys the law of demand which states that there is an inverse relationship between price and quantity demanded of commodity. The reasons behind downward slope of the demand curve are:

(a) Law of Diminishing Marginal Utility

This law was formulated by Marshall and it states that as the consumer has more and more of a good its marginal utility to him goes on declining. A consumer is not interested in buying more units of the same commodity at the same price. Instead, he is ready to pay a price equal to his marginal utility and marginal utility goes on diminishing. In other words, he is willing to pay a lesser price for more units of a Commodity. This implies that demand curve is downward sloping.

(b) Substitution Effect

Substitution effect means with fall in the price of a good, there is a rise in relative price of other goods, which in turn leads to more demand of the good. Similarly, when the price of a good rises, consumer buys more of substitute goods and less of the good whose price has risen. This shows inverse relationship between price and quantity demanded.

(c) Income Effect

Income effect means with fall in the price of a good, consumer's real income or purchasing power rises and he demands more units of the good (normal good). Thus, when price falls, demand rises.

(d) New Consumers Creating Demand

Price of a commodity falls, new consumer class appears, who can now afford the commodity. Thus, the total demand for the commodity increases, i.e. with fall in price, quantity demanded rises.

4. Exceptions to the Law of Demand

There are certain cases where the law of demand gets violated. That is, there is direct relation between price and quantity demanded. If price rises, consumption also increases and vice-versa. The cases where the law of demand does not hold are:

(a) Giffen Good

The good is named after Sir Robert Giffen (1837-1910). Giffen good is necessarily an inferior good with very high negative income elasticity of demand. The good is consumed by low paid wage earners who spend a large proportion of their income to buy it. Examples of giffen goods are jowar and bajra. In case of giffen goods, the demand curve is upward sloping.

(b) Veblen Good

The good is named after ThornStein Veblen (1857-1929). Veblen Good is a prestigious good or goods with status symbol. It promotes social prestige of the holder. Prof. Veblen gave the example of diamonds. Diamonds and other precious stones are all status goods. Higher the prices more is the demand for them. Veblen goods are articles of conspicuous consumption.

(c) Expectation of a price rise in future

Buyers' expectations about price dominate the buying behavior. If price rises and the buyer expects further rise in price then it causes increase in the quantity bought at higher prices. The reverse also holds. This is specially true in case of shares.

(d) Band Wagon Effect

Band Wagon effect is another exception to the law of demand which refers to a kind of demonstration effect shown by a section of society which tends to imitate the consumption pattern of higher income groups or some popular film star or some charismatic personality. In this case, the law of demand gets violated because people demand more of that commodity which the upper class people are buying even at higher prices. For example, teenagers are obsessed to copy the consumption habits of their favorite film stars. Hence, for the law of demand to hold goods, bandwagon effect must be ruled out.

(e) Emergency

In case of emergencies like flood, drought or famine the law of demand does not hold. In such cases there is general insecurity and fear of shortage of necessities. Hence, consumers demand more good even at higher prices.

Difference between 'Change in Demand' and 'Amount Demanded'

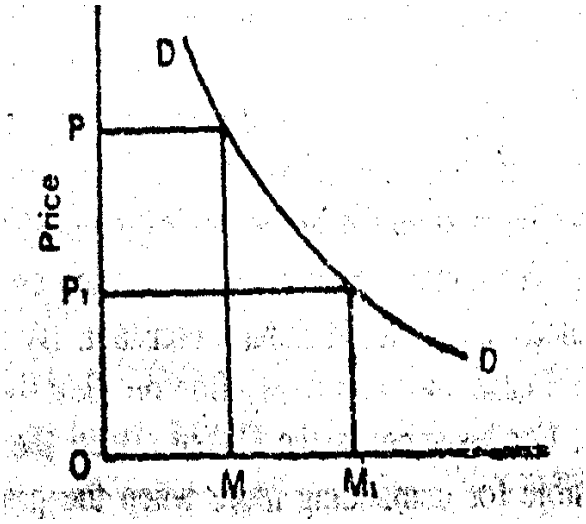
In ordinary language many expressions in demand are used in a loose and indiscriminate manner. Terms like increase and decrease in demand, extension and contraction of demand, change in demand and change in the quantity demanded, etc., are not clearly mentioned or understood.

If a person buys more because the price has fallen, it is only an extension of demand. This can be called change in the quantity demanded. But there is no change in the 'demand' itself. Extension and contraction of demand indicate movement along the same demand curve. Other things arc assumed constant and the price change is studied in the form of changes in the quantity demanded. Any movement on the demand curve given below (DD) refers to contraction and expansion of the quantities demanded. Thus 'amount demanded' changes only with reference to price. Apart from price, if other factors like population, taste, fashions, change in income, change in trade condition, etc., cause changes in demand, it is a change in demand itself. Consequently, the demand curve shifts either upwards or downwards. When circumstances change, the demand curve itself shifts from its position.

The figures given will illustrate the point clearly:

FIGURE 7.5

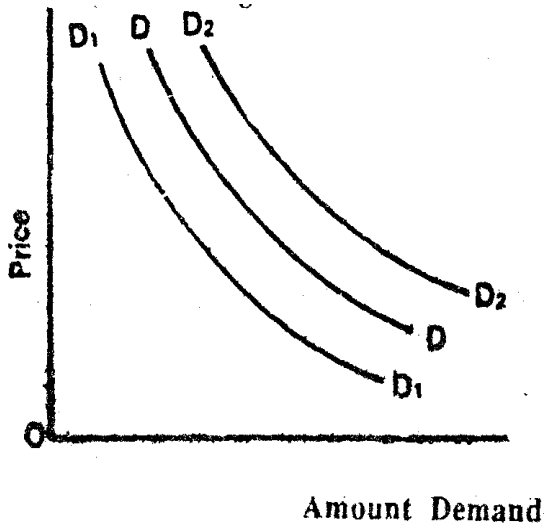
Change in the Amount Demanded



In the figure 7.5, DD is the demand curve and any movement up and down the demand curve shows contraction or expansion of demand. When the price is OP, OM amount is demanded. When the price falls to $O P_1$, $O M_1$ amount is demanded.

FIGURE 7.6

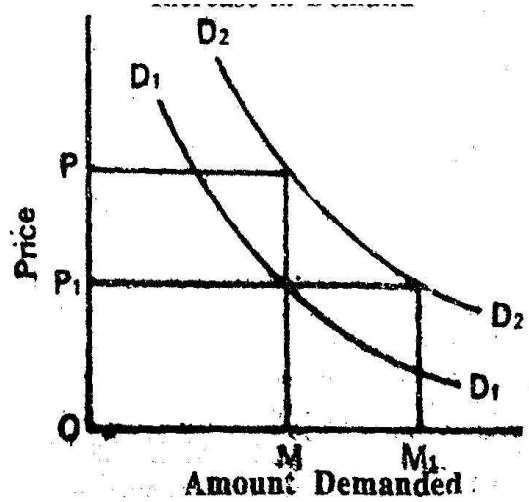
Change in Demand



DD = Original Demand, D_1D_1 Decreased Demand, D_2D_2 Increased Demand.

FIGURE 7.7.

Increase in Demand



Increase in demand implies that at any, given price a larger amount is demanded or that any given amount is demanded at a higher price. For a price OP. larger amount is demanded in D_2D_2 over D_1D_1. Conversely, a decrease in demand 'implies' that at any given price a smaller amount is demanded or that any given amount is demanded at a lower price, as in figure 7.7.

Demand distinctions

Demand analysis depends on the nature of goods and the type of demand. Generally goods are classified into various categories and the demand analysis must be designed for a specific purpose. For example, a set of forces acting as determinants of demand of product 'X' may be irrelevant for the demand of product 'Y'. The forces of creating demand for "butter" are entirely irrelevant to the demand for steel, as the former comes under the category consumers' goods and the latter under producers' goods. Construction activities will create demand for steel, timber, cement and paints. Demands for perishables for perishables are different from durable goods.

The Law of Supply

1. Definition of Supply

Definition: Law of supply derives the relationship between price and quantity supplied. According to the law of supply, other things remaining the same, quantity supplied of a commodity is directly related to the price of the commodity. In other words, other things remaining the same, when price of a commodity rises, its quantity supplied increases and when the price falls, quantity supplied also falls. Symbolically, the law of supply is expressed as:

$$S_X = f(P_X), \text{ceteris paribus}$$

2. The Supply Schedule and the Supply Curve

Supply schedule is a tabular statement that gives the law of supply, i.e., different quantity of a commodity supplied at different prices per unit of time.

A hypothetical supply schedule of wheat is given in Table 2.1.

Table 2.1 : Supply Schedule of Wheat

Price (Rs. Per Kg)	Quantity supplied (Kg per month)	Reference Point (Fig 2.1)
1	10	A
2	20	B
3	30	C

The supply schedule obeys the law of supply,, i.e., a price of wheat rises, its supply also rises. Supply Curve shows graphically the relationship between quantity supplied of a commodity to its price. The curve shows positive or direct relationship between the price and quantity supplied of the commodity. It can be a straight line or a curve. With rise in price, the quantity supplied rises as shown in Fig. 2.1.

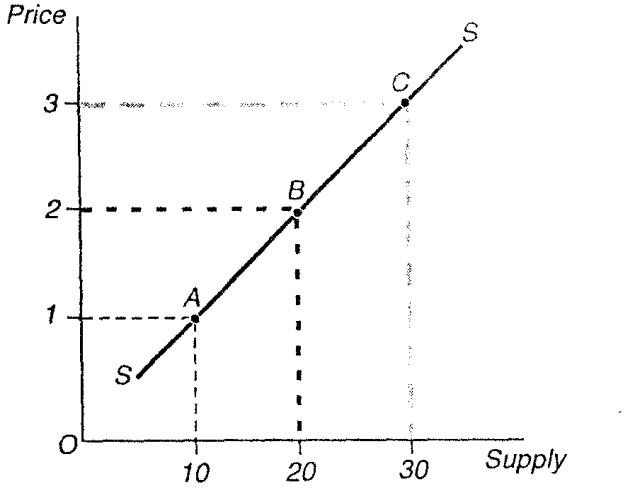


Fig. 2.1 : The Supply Curve of an Individual Producer

SS is the upward sloping supply curve obeying the law of supply.

3. Reasons behind Upward Sloping Supply Curve

The main reasons behind an upward sloping supply curve are:

(a) The law of diminishing marginal productivity. The law states that as more units of the variable factor are employed, the addition made to total production falls, i.e., cost of production rises. Thus, more quantity is supplied only at higher prices so as to cover the rise in cost of production.

(b) Goal of profit maximisation. The aim of producers is to maximise profits. The aim can be achieved by raising the price of the goods. At higher price producers increase the supply of the goods.

Factors Determining Supply

There are a number of factors affecting supply of a commodity like discoveries, new technology, weather conditions, price of substitutes, changes is input supply, etc. It is difficult, to analyse the effect of all the factors on

supply simultaneously. Thus, we study the effect of any one factor on supply and other factors are assumed to be constant.

Supply function is a functional relationship between quantity supplied of a commodity and factors affecting it. The supply function can be written as:

$$S_X = f(P_X, P_Z, T, C, G_P)$$

where

S_X	=	Supply of commodity .
f	=	function of Price of commodity X
P_2	=	Price of related good, Z
T	=	Technological Changes
C	=	Cost of production or price of inputs
G_P	=	Government policy or excise tax rate

The explanation of these factors is as follows:

1. Price of the Commodity

At a higher price, producer offers more quantity of the commodity for sale and at a lower price, less quantity of the commodity .There is a direct relationship as shown by Law of Supply.

2. Price of Related Good (Z)

Supply of a commodity depends upon the prices of its related goods, specially substitute goods. If the price of a commodity remains constant and the price of its substitute good Z increases, the producers would prefer to produce substitute good Z. As a result, the supply of commodity X will decrease and that of substitute good Z will increase. This will shift the supply curve of good X leftward. Thus, an increase in the price of substitute good will lead to decrease in supply curve of the other good and vice versa.

3. State of Technology

If there is a change in the technique of production or new discovery leading to reduction, in the cost of production, and the supply of commodity will increase.

Change in Supply (Shift): Increase or Decrease in Supply

A shift in supply curve is caused by changes in factors other than the price of the good. These factors are:

(a) Price of other commodities

(b) State of technology

(c) Cost of production

(d) Government policy

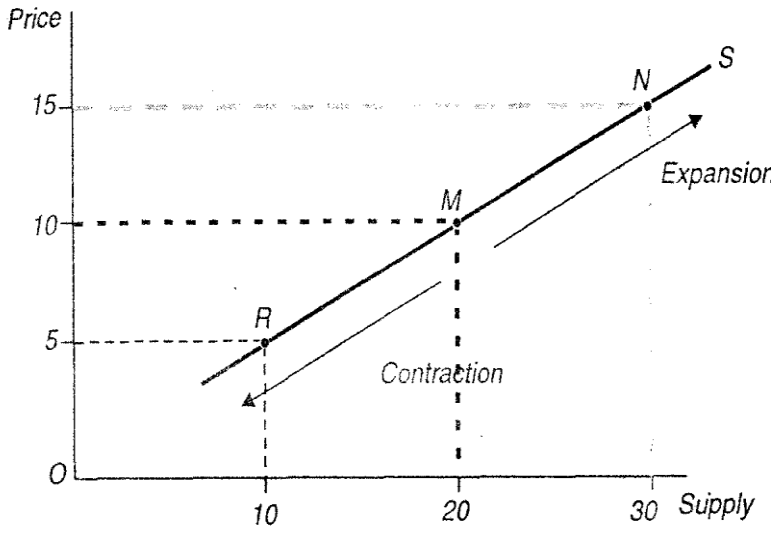


Fig. 2.7 : Movement Along Supply Curve

A change in any of these factors causes shift in the supply curve. It is also called change in supply. In a shift, a new supply curve is drawn. A shift of the supply curve can be of two types:

(a) Increase in supply, or

(b) Decrease in supply

(a) Increase in supply

When supply of a commodity rises due to favourable changes in factors other than price of the commodity, it is called increase in supply. Favourable changes imply:

(i) Improvement in technique of production

(ii) Fall in the price of related goods

(iii) Fall in the cost of production

(iv) Fall in excise tax

Increase means more supply at the same price, or same supply at a lower price. Increase in supply can be shown with the help of a supply schedule as given in Table 2.5.

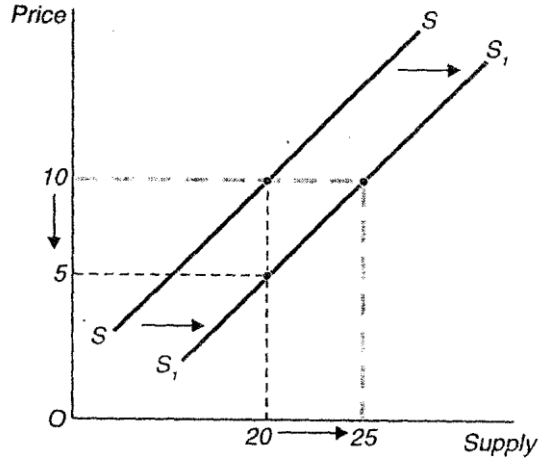


Fig. 2.8 : Shift in Supply Curve: Increase in Supply

Table 2.5: Increase in Supply

Original Supply Schedule		Revised Supply Schedule for increase in supply	
P_X (Rs.)	Q_X (units)	P_X (Rs.)	Q_X (units)
10	20	Either 10 or 5	25 20

Increase in supply is graphically shown in Fig. 2.8 where quantity supplied is measured on the x-axis and price of the commodity on the y-axis.

SS is the original supply curve. An increase in supply is shown by rightward shift of the supply curve from SS toS_1S_1. An increase in supply shows that:

(i) either at the original price of Rs. 10, more units (25 units) of the good are supplied. In the original situation 20 units were supplied.

(ii) or same units (20 units) are supplied at a lower price of Rs. 5.

(b) Decrease in Supply

When supply of a commodity falls due to unfavourable changes in factors other than its price, it is called decrease in supply. The causes of decrease in supply are:

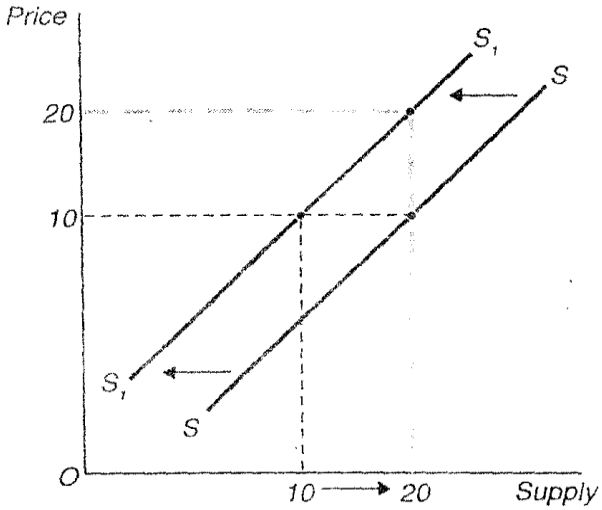


Fig. 2.9 : Shift in Supply Curve : Decrease in Supply

i) Obsolete technique of production

ii) increase in the price of related goods

iii) Increase in the cost of production

iv) Rise in excise tax

Decrease means same quantity supplied at a higher price or less quantity supplied at the same price. Decrease in supply is shown with the help of supply schedule as given in Table 2.6 and graphically as in Fig. 2.9.

Table 2.6 : Decrease in Supply

Original Supply		Revised Supply Schedule for increase in supply.	
P_X (Rs.)	Q_X (units)	P_X (Rs.)	Q_X (units)
10	20	Either 10 or 20	10 20

In the figure, SS is the original supply curve. A decrease in supply is shown by leftward shift of the supply curve from SS to S_1S_1. A decrease in supply shows that:

(i) either at the original price of Rs. 10, lesser units (10 units) of good are supplied. In the original situation 20 units were supplied.

(ii) or same units (20 units) are supplied at a higher price of Rs. 20.

UTILITY ANALYSIS

Meaning and measurement of Utility

What is Utility? "Utility is the power or capacity of a commodity or service to satisfy a human want. Utility is not inherent in a commodity, so that anyone who uses it will get it. A south Indian may relish strong black coffee and derive much utility but a Punjabi may hate it. Utility is thus subjective,

depending upon the mental make-up of a particular consumer. As long as a commodity has some use-i.e., it has the capacity to satisfy a person – it has utility. However, we must distinguish between utility and usefulness. Silk and nylon may not be as useful as wool in giving warmth during winter but as woman demand then and use them, silk and nylon garments have utility. A drunkard may be aware that liquor is harmful, yet liquor has utility since it can satisfy a human want. Utility has no moral or legal implications. Possession of a gun by a thief and a dacoit may be dangerous and illegal, but the gun has utility since it is wanted by some person and since it commands a price. In simple terms, utility therefore, refers to the power of a commodity to satisfy human want.

Concepts of Total Utility and Marginal Utility

According to Prof. Meyers "Total utility is the amount of satisfaction derived from the consumption of or possession of a good". Marginal utility on the other hand is the utility or satisfaction derived from one more unit of that commodity. According to Prof. Boulding "Marginal utility of any quantity of commodity is the increase in the total utility which results from a unit increase in consumption". Prof. Bilas points out that "Marginal utility is defined as the change in total utility resulting from a one unit change in the consumption of the goods in question per unit of time". To put it shortly, total utility is the total satisfaction derived in consuming all the quantities of a commodity in possession or purchased. Marginal utility is the utility or satisfaction derived in consuming just one unit of that commodity. It follows that the total utility of a commodity is the sum total of marginal utilities of units composing the commodity.

Marginal Utility Analysis (Cardinal)

The Law of Diminishing Marginal Utility

The principle behind the Law of Diminishing Marginal Utility is that as we get more of a thing, the intensity of our desire for that thing diminishes or tends to diminish. We become gradually indifferent, as we go on consuming them. This tendency shows itself in the consumption of almost every commodity and this law is based on the important characteristics of human wants, viz., satiable.

According to this law, as a person purchases more and more units of a commodity, its marginal utility decreases. Prof. Boulding defines the law of Diminishing marginal Utility in the following words "As a consumer increases the consumption of any one commodity, keeping constant the consumption of all other commodities the marginal utility of the variable commodity must eventually decline"[1]. Marshall has defined the law thus; "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 long and short of the definition is that "the more of a thing we have, the less we want it".

The law simply states that as the consumer takes more and more units of a particular commodity, the marginal utility of additional units goes on

diminishing. But the law does not state the rate of decline of marginal utility; it does not say whether marginal utility diminishes at a uniform rate or at a variable rate or it diminishes slowly or fast.

Illustration of the Law

The law can be illustrated in the following way. Suppose a man is hungry. A loaf of bread will give him immense pleasure as it has great utility for him. The second loaf though agreeable to him would not give him as much satisfaction as the first one. This means the utility of the second loaf would be less than the first loaf, if he consumes the third loaf, it would give him some satisfaction or utility but not to the extent of the previous loaf. So also with the fourth, fifth and sixth loaves. Thus the utility obtained from the successive loaves of bread goes on diminishing. A point will soon be reached when the consumer would cry "Enough now" or "I do not want bread". This is the point of satiety and the utility of bread drops to zero for the time being. If consumption of bread is continued still further, he would get disutility.

Why the additional utility of each loaf (marginal utility) goes on diminishing? Utility, as we know, is the want-satisfying quality of a commodity. Thus, how much utility a thing possesses depends upon the intensity of want for that commodity. When a man consumes more and more of a commodity, his want for that commodity becomes less intense. When the intensity of want declines, logically, there is a fall in utility as it depends upon the intensity of want. When the man is fully satisfied his intensity of 'that want' is Zero and the utility also becomes Zero. It is obvious that the law of diminishing marginal utility describes a very familiar and fundamental tendency of human nature. 'This law can be arrived at by introspection and by observing the people and studying how they behave. If there reaction of the consumer could be properly assessed and if the utility could be qualified the utility table of our consumer could be framed as follows

TABLE 6-1

Utility Table

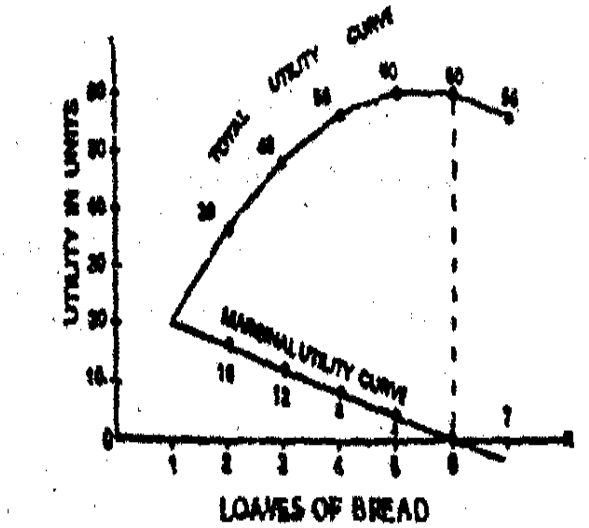
Number of Loaves	Marginal Utility	Total Utility
1	20	20
2	16	36
3	12	48
4	8	56
5	4	60
6	0	60
7	-4	56

From the utility table, it is clear that the total utility (sum of the utilities of all the units consumed) goes on increasing and after a certain state begins to decline. The marginal utility (addition made to the total utility) on the other hand goes on diminishing till it reaches zero and then it becomes negative. So long as the marginal utility is tending towards zero, the total utility is increasing and it is at the maximum when the marginal utility is zero and afterwards it declines.

The relationship between total utility and marginal utility can be illustrated by means of a graph based on the utility table given.

FIGURE 6-1

Total arid Marginal Utility



The successive units of the commodity consumed (i.e., loaves of bread) are represented in 'X' axis and utility in units are represented in 'Y' axis. With the help of the data available in the utility table, the total utility and marginal utility at various levels of consumption are pointed and then the Total Utility curve and the Marginal utility curve are drawn. As the figure shows, total utility curve ascends, reaches the maximum point at the fifth and sixth units of consumption and then begins to decline. Marginal utility declines straight and it comes to zero at the consumption of sixth unit and afterwards it becomes negative.

Assumptions of the Law

(1) The successive units of commodities consumed should be identical and homogeneous in all respects without any change in quality, taste, flavour, etc. The law will not operate if the first loaf is taken with sugar, the second loaf with butter and the third loaf with jam. In that case we are considering different commodities having different units.

(2) The unit consumed should be of the standard unit. For example, if it is bread, it should be loaves of bread; if it is coffee or tea, the standard cup should he used. Excessively small quantities of the commodity should not be administered to see the operation of the law. If it is food, one

square meal should be the standard unit. If it is water for drinking, the cup should be the standard unit; if it is for taking bath, the standard unit should be a tub or a bucket of water. If it is for aquatic sport, the pond or the river or tank should be the unit.

(3) The units consumed should be successive without interval of time. The law is true only at a given time. The law will not be valid if the first loaf if taken in the morning, the second loaf in the evening, etc.

(4) The taste, preference of the consumer should not be changed. There must be no change in the consumer himself.

(5) The income of the consumer remains constant.

The Principle of Equi-marginal Utility

We assume that every rational consumer, with a limited income, spends it not in a thoughtless, confused and haphazard manner but with a clear idea of maximising his satisfaction. Whenever a person buys more and more units of a commodity, he gets less and less utility from the additional units. At the same time, as he buys more units of one commodity, he has less money left with him for other goods and services. A prudent and sensible consumer will avoid extending purchases of any one commodity too far. When a consumer spends his limited income carefully on various goods and services and gets maximum satisfaction he is said to be in equilibrium. The problem of consumer's equilibrium implies

(a) Given the price of a commodity, how much of it will a consumer buy and

(b) Given the prices of two or more goods and also given his total income, how much of each good will the consumer buy or how will he spend his total income on the purchase of different goods?

The first question can be answered easily. We know that every rational consumer, interested in maximising his satisfaction, will continue to demand a commodity so long as the marginal utility he gets is greater than the price he has to pay for it and he will stop only at that point where marginal utility (measured in terms of money) is equal to the price.

Table 2. Marginal utility schedule

No. of Apples	Marginal utility (in money)
1st apple	1.00
2nd apple	0.80
3rd apple	0.60
4th apple	0.40
5th apple	0.20

In Table 2, the marginal utility of apples is given in terms of money. Suppose that the price of apple is 60 poise in the market, our consumer will be able to, demand 3 apples; at that point, the price he pays is equal to the

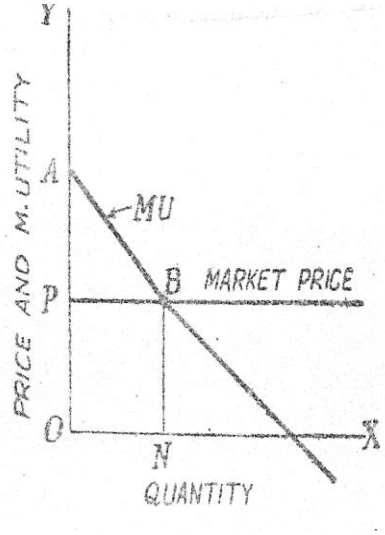
marginal utility of apples. He cannot demand more apples because- price is higher than the marginal utility he gets. Thus at the point of equilibrium, marginal utility (in terms of money) is equal to the price of the commodity. This is illustrated geometrically as follows.

In Fig. 3 the marginal utility curve slopes downward but the market price is assumed to be constant. . We further assume that utility of money is constant, whatever be the number of units the consumer buys or whatever be the amount of money he spends. Now, the consumer stops buying ON units because at this point, the price which he pays is exactly equal to the marginal utility which he derives. For ON units purchased:

Total utility = OABN

Total amount of money spent = OPBN (i.e. OP X ON)

Maximum surplus utility = APB



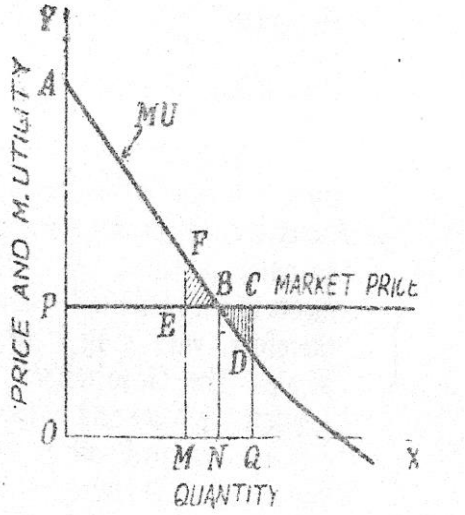


Fig. 3. **Fig. 4.**

That ON is the maximum quantity the consumer can buy is easily proved from Fig. 4, which is an improvement over Fig. 3. If he buys more, say NQ, the price the consumer pays exceeds the marginal utility he gets from NQ units. This means that the purchase of NQ units will result in loss of satisfaction equal to the area BCD which will have to be deducted from the maximum surplus utfetuyc ai rf soli APB. On the other band, if the consumer buys less, say at M units, his surplus utility area will not be maximized it wilt be equal only to APEF. If the consumer cares to buy MN units, he would secure the additional utility represented by the area FEB. Hence under the assumption of maximum satisfaction, the consumer would reach the equilibrium point represented by point B at which marginal utility (in terms of money) is equal to price. Marshall expresses this condition of equilibrium as

$$MU_A = P_A \times MU_x$$

$$\text{Or} \quad \frac{MU_A}{P_A} = MU_x$$

in this,

MU_A = Marginal utility of commodity A

P_A = Price of commodity A

MU_x = Marginal utility of money

The above formula states, in equilibrium, the consumer gets maximum satisfaction when the ratio between marginal utility, of a good and its price (MU/Price) is equal to the marginal utility of money.

Equilibrium with two or more goods

In practice, every person has to buy two or more goods. Naturally he will have to spend his limited income carefully so that he can maximise his satisfaction. The condition of equilibrium applied to one commodity A will have to be extended to cover more than one commodity:

$$\frac{MU_A}{P_A} = MU_x, \text{ which is a constant}$$

In the case of commodities, B, C, etc., the equilibrium condition will be

$$\frac{MU_B}{P_B} = MU_x$$

Since Marginal Utility of Money is assumed to be constant, we can formulate the equilibrium condition for two or more goods as follows:

which is a constant.

$$\frac{MU_A}{P_A} = \frac{MU_B}{P_B} = \frac{MU_C}{P_C} = ... = MU_X$$

The above condition expresses the principle of maximum satisfaction which is more commonly called the law of equi-marginal utility. This law states that a consumer maximises his satisfaction when he allocates his limited income in such a way that the marginal utilities of different goods (in relation to their prices) are equal to the marginal utility of his money income.

INDIFFERENCE CURVE ANALYSIS

Alfred Marshall's Demand Analysis on the basis of marginal utility is based on the Cardinal System of measuring the utility contained in the commodity purchased. This Cardinal approach is defective in many respects, as utility is purely a mental phenomenon and it cannot be quantified. We had studied already the defects of cardinal system of analysis. Further, Marshall's analysis had created a lot of confusion due to unrealistic assumptions. Hence, modern economists have evolved the Indifference Curve approach, based on the Ordinal System to explain the behaviour of the consumer. The Indifference Curve approach was first outlined by Pareto, an Italian economist. Later on, it was developed by the Russian economist Slutsky in 1915. It was presented in detail and popularized by J.R. Hicks and R.G.D. Allen in "A Reconsideration of Theory of Value" in 1934. Later on in 1939, J.R.Hicks in his famous work "Value and Capital" offered a detailed treatment of this new analysis.

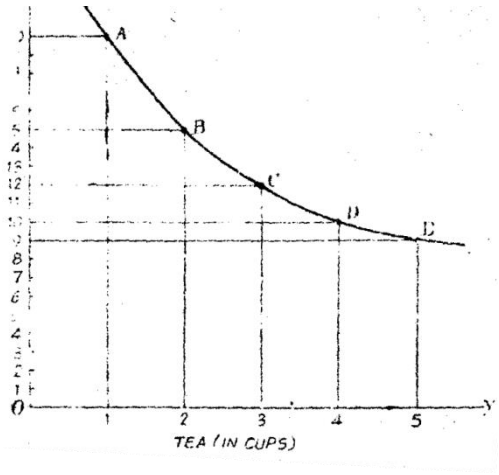
The Indifference Curve Analysis of Demand

The indifference approach starts with the assumption that consumers are rational and are aware of their preference of any two or more goods. For instance, a consumer can clearly express his scale of preference for any two or more goods. A scale of preference consists of a number of alternative combinations of two good which give the consumer the same amount of satisfaction. Since all the alternative combinations of the two goods give the consumer the same satisfaction, he can choose any one of them, if he chooses one combination; he is indifferent about the other combinations. Table 1 is an imaginary indifference schedule representing a certain amount of satisfaction to a consumer between tea and biscuits.

Table 1: Indifference Schedule for Tea and Biscuits

Tea (cups)		Biscuits (units)	Rate of substitution
1	+	20	1:5
2	+	15	1:3
3	+	12	1:2
4	+	10	1:1

We assume that the various combinations of tea and biscuits yield the same satisfactions to the consumer (we do not say by how much, since satisfaction is not-measurable.) The curve obtained by plotting the various combination as drawn in Fig. 1, is known as the indifference curve. This curve shows the various combination (A,B,C.D etc.) which will yield the consumer the same satisfaction. An indifference curve is also known as a curve, at every point on the indifference curve represents the same utility to the consumer. Therefore, the consumer can choose (Fig. 1.) any One of the points (A or B or C etc.) to get that utility. If he chooses one point (representing a combination of tea and biscuits) he becomes indifferent to the other that is why this analysis of consumer behaviour has come to be known as the indifference curve technique.



Properties of Indifference Curves

Indifference curves have three features or properties:

(a) They always slope downward from left to right;

(b) They are convex to the point of origin of the two axes; and

(c) They never intersect or touch each other.

We shall explain these three properties and the assumptions on which they are based.

Slope downward from the left to the right

All indifference curves necessarily slope downward from left to right. This is based on the assumption that different combinations of two goods give the consumer the same amount of satisfaction; if one commodity is added, the other commodity has to be decreased. An upward sloping indifference curve is impossible and is an absurdity.

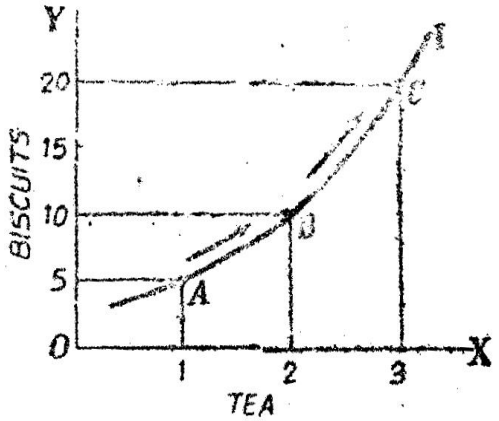


Fig. 6 is based on the following:

1 cup of tea +5 biscuits

2 cups of tea +10 biscuits

3 cups of tea +20 biscuits

It is clear that all these three combinations of tea and biscuits cannot give the same satisfaction because the second combination will give the

consumer more satisfaction than the first, as it has more of both goods and the third combination will give him more satisfaction than the second. As long as we assume that an indifference curve represents only one satisfaction) it cannot slope upwards.

Nor can indifference curve be horizontal, as is shown in Fig. 7. This figure is based on Table 3.

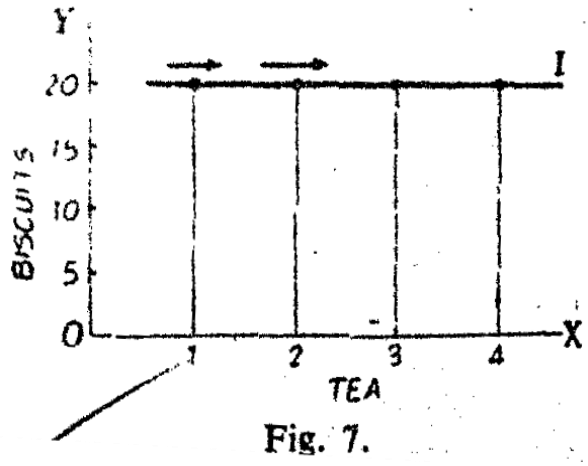


Fig. 7.

Table3. One Commodity is increasing and another constant.

Tea (cups)		Biscuits (units)
1	+	20
2	+	20
3	+	20
4	+	20

All these combination of tea and biscuits are said to represent the same satisfaction. This too is absurd, as the second combination will give the consumer, more satisfaction than the first; the third, more than the second; and so on. But our assumption is that all combination represents the same Utility.

If indifference curves cannot slope upward or cannot be horizontal, there is only one possibility they necessarily slope downward, from left to right. This is the first property of indifference curves.

Convex to the point of origin of the two axes

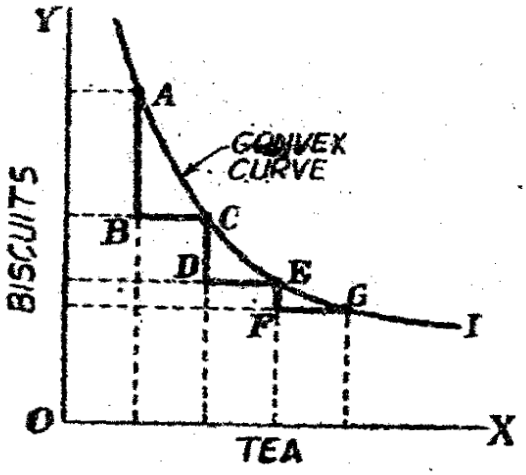
The second property or feature of indifference curves is that they arc generally convex to the origin of the axes—the curve is relatively steep at first, but tends to become horizontal. This property of indifference curves is based on the assumption of diminishing marginal rate of technical substitution. In Fig. 8

the Indifference curve is convex from the point of origin of the axes (O). In Fig. 8

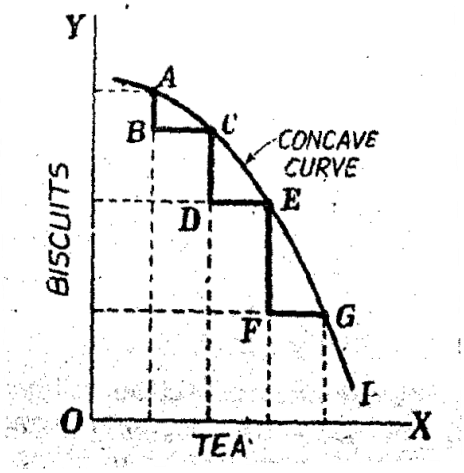
BC tea substitutes AB biscuits

DE tea substitutes CD biscuits

FG tea substitutes EF biscuits



It may be noted that BC=DE=FG; but AB>CD>pp. This shows clearly that the rate of substitution of tea for biscuits is diminishing. It is this diminishing rate of Substitution which is responsible for the convexity of indifference curves. An indifference curve cannot be concave, because such a curve (Fig. 9) represents an increasing marginal rate of substitution of tea for biscuits.



In Fig. 9 we find that

BC tea substitutes AB biscuits

DE tea substitutes CD biscuits

FG tea substitutes EF biscuits

While BC=DE=FG, AB<CD<EF. The concave indifference curve shows that the same amount of a commodity X will substitute for an increasing amount of commodity Y. A concave indifference curve is possible only if we assume that (a) marginal utility of a commodity will increase when the consumer has more units of it; and (b) marginal utility will decrease when he has less units of it. These two assumptions are against observed facts of human behaviour. Naturally, a concave indifference curve is impossibility. However, there are two other types of indifference curves which are in between the "normal" convex indifference curves and "abnormal" concave indifference curves. The first is a downward sloping indifference curve with a zero curvature i.e., a straight line (Fig. 4). This applies to perfect. The second type of indifference curve may have a sharp kink in its slope towards the origin such that indifference curve will have the shape of a right angle (Fig. 5). These two types of indifference curves are unimportant from the practical point of view, because (a) if two goods are perfect substitutes, they nay be taken as one commodity, and b) perfectly complementary goods are difficult to come across. We therefore, reach the conclusion that indifference curves arc normally concave to like point of origin of the axes.

Never intersect each other

Finally, indifference curves will never intersect each other. This property is based on the assumption that each indifference curve represents one utility and that different indifference curves represent different utilities. One satisfaction may be higher or lower than the other but cannot be higher and lower as well as equal to the other, at the same time. In Fig. 10, I_1 is higher than I_2 below point A, but less than I_2 above point A and is equal to I_1 at point A. This is clearly impossible. It may be observed that we have two combinations A and B representing satisfaction I_2 and A and C

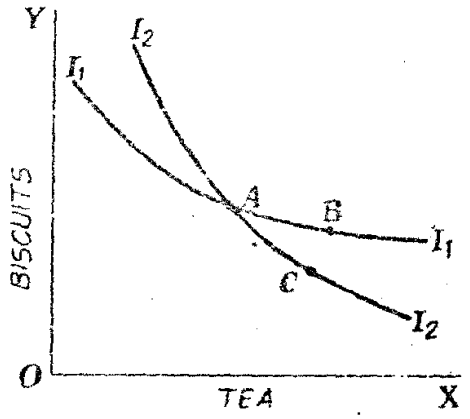


Fig. 10

Now,

A =B

A = C

B = C

This conclusion is absurd and it clearly points out that the indifference curves of a person for two commodities can never intersect or touch each other.

Consumer's Equilibrium in Indifference Analysis

As a consumer has a limited income, he aims to spend it in such a manner as to obtain maximum satisfaction. He will attain equilibrium when be gets maximum satisfaction from his expenditure on different goods. According to the utility analysis, a consumer gets maximum satisfaction when marginal utilities from his different purchases are equal. The formula for consumer's equilibrium is

$$\frac{\text{MU of A}}{\text{Price of A}} = \frac{\text{MU of B}}{\text{Price of B}} = \frac{\text{MU of C}}{\text{Price of C}} = \text{MU}_m \text{ which is constant.}$$

Here we shall explain the equilibrium of the consumer with the help of the indifference curve technique.

Assumptions of the Analysis

For our analysis, we have to make the following assumptions:

(a) The consumer has before him an indifference map for a pair of goods say, tea and biscuits. This map represents the preferences of theconsumer for the two goods. It is assumed that his scales of preferences remain constant at a given time.

(b) The consumer has a fixed amount of money to spend on the two goods. It is assumed that he will spend the amount on both the goods and not save any part of it.

(c) The prices of these goods are given in the market and are assumed to be constant.

(d) The consumer is assumed to act rationally and maximise his satisfaction.

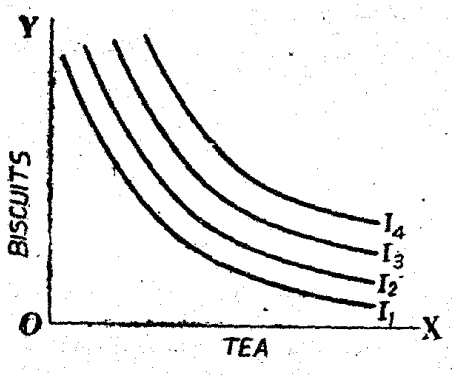


Fig. 11

A consumer's indifference map for tea and biscuits is given in Fig. 11; it represents four scales of preferences of a consumer for the two goods. Indifference curves to the right represent progressively higher satisfactions. The consumer would like to choose a combination of tea and biscuits which will be on the highest indifference curve. But this will depend upon the income which the consumer has, and the price of the two goods.

Budget Line of the Consumer

Suppose that the consumer has Rs.10 to spend on tea and biscuits which cost 25 paise and 20 paise respectively. The consumer has three alternative possibilities before him:

a) He may decide to buy biscuits only, in which case he can buy 40 cups of tea.

b) He may decide to buy biscuits only, in which case he can buy 50 biscuits.

c) He may decide to buy some quantity of both the goods, say 20 cups of tea (Rs.5) and 25 biscuits (Rs.5) or 12 cups of tea (Rs.300) and 35 biscuits (Rs.700), and so on (Total amount Rs.10).

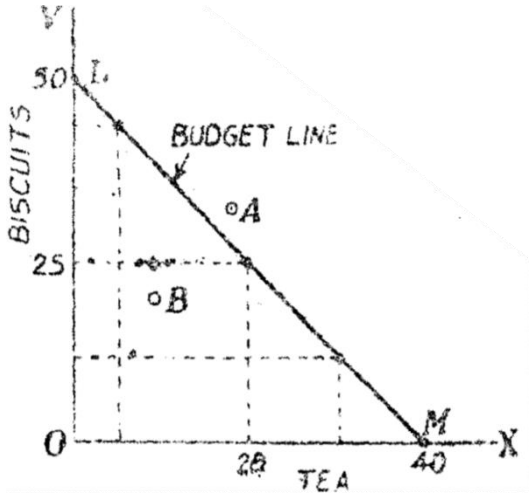


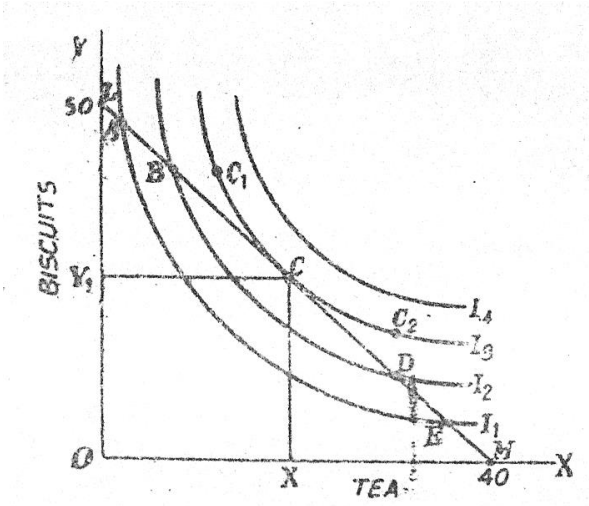
Fig. 12

Fig. 12 shows these three possibilities. The line LM represents maximum amount of biscuits (50) and of tea (40 cups) which the consumer can buy with his income of Rs.10. The line LM shows that the consumer cannot choose any combination beyond this line because his income does not permit him. Not would he little to choose a combination below this line, say, B, as it will not represent the maximum satisfaction. Line LM known as the budget line since it represents the various amounts the consumer can buy with his income. LM is also known as the price ratio line or simply the price line since its slope represents the ratio of price between the two goods (i.e., 50 biscuits=4O cups of tea).

Line LM can also be called the consumption possibility line since it represents the different possibilities of the two goods the consumer can afford with his given income. Now, by combining the preference schedules of the consumer and the budget line, we can find out the best position for the consumer. This is illustrated in Fig. 13, which is a combination of Fig. 11 and 12.

It will be observed from Fig. 13, that I_4 is unsuitable to the consumer, since it falls outside the consumer's price-line LM. Indifference curves I_1 and I_2 are all right and can be realised with the money income with the consumer. But these curves represent lower satisfactions; it is possible for the consumer to achieve still higher satisfaction by moving to a higher indifference curve with the same amount of money. Such a satisfaction is indicated by the point C on indifference curve I_3. The consumer gets the maximum possible satisfaction from his income of Rs.10 when he buys a combination of X_1 amount of tea and Y_1 number of biscuits. Any other possible combination of the two goods will either yield less satisfaction or will be unobtainable at present prices, with the given amount of income at the disposal of the consumer. Consider, for instance, points A, B, C, D, and E. All of them can be bought by the consumer as they are on his budget line LM. But the combination represented by C is the best as it is I_3 while all others are on I_1 and I_2. Again consider points C_1 and C_2 on I_3. Both represent the same satisfaction as point C, for all of them are on the same indifference curve I_3. Bu with the income price-line being LM, the consumer can buy the combination represented by C but not the combinations represented by C_1 and C_2. Therefore, the equilibrium of the consumer is attained at the point C at which with an income of Rs. 10 and given the prices of the two goods, the consumer reaches the highest indifference curve possible (i.e., gets maximum satisfaction). What is then the condition of equilibrium of the consumer in the indifference curve analysis .

Fig. 13



At the point of equilibrium (point C) the price-line LM is tangent to the indifference curve 13. At point C the indifference curve and the price-1inehave the same slope. Now the slope of the indifference curve represents the marginal rate of substitution; and the budget line shows the ratio of prices between the two goods. At point C the marginal rate of substitution between the two goods as indicated by the slope of the indifference curve 12 and the two goods as

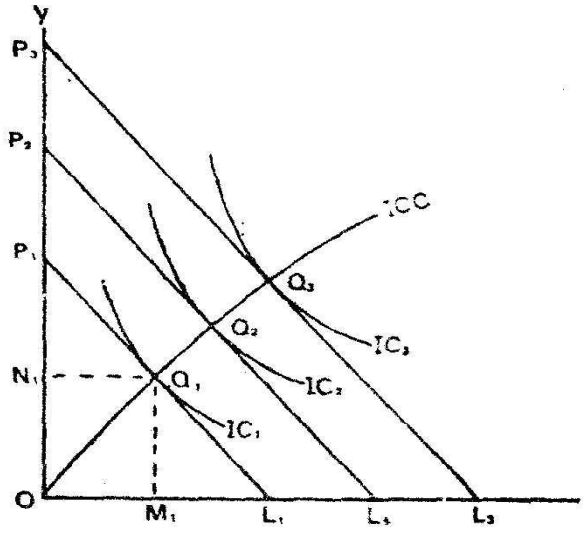
indicated by the price-line LM are equal. This point, therefore, indicates the ideal combination between the two commodities, giving the consumer the highest satisfaction possible with his limited income. At this point, therefore, the consumer is in equilibrium. The fundamental condition of equilibrium is that the marginal rate of substitution of commodity X should be equal to the rat of prices between the two goods.

The Income Effect on Demand

'It is natural to think that the income of a consumer may vary from time to time. Whenever there is an increase in income, the consumer feels better off and so he purchases more of commodities and realises more of satisfaction. A decrease in income will make him worse off and he may have to reduce his total satisfaction as he can purchase only lesser quantities due to lesser income. So, the effect of a change in the consumer's income on his total satisfaction is known as income Effect. The income effect may be defined as the effect on the purchases of the consumer caused by changes in income with prices of goods remaining constant.

The equilibrium position of the consumer shifts to a higher indifference curve with an increase in income and if there is a decrease in income the equilibrium position shifts to a lower indifference curve. The relationship between income and consumption is .traced through income-consumption Curve. By drawing the income-consumption curve we can trace the income effect on consumer's equilibrium position. We shall now study the implications of Income-consumption curve and also the technique of drawing this curve. This can be explained with the help of the Figure 8.19.

Figure 8.19.



Income-Consumption Curve

With given prices of two goods x and y and the income of the consumer we have drawn his price-line P_1L_1 as shown in the figure. The consumer comes

to equilibrium at point Q_1 in the indifference curve No. 1 and purchases M_1 quantities of x and N_1 quantities of y commodity. Now, suppose, the income of the consumer increases. With this increased income (price of two commodities remains constant) the consumer can purchase more of x and y commodities. As a result the price-line shifts to a new position P_2L_2 at a higher level parallel to the original price line P_1L_1. In the new price-line P_2L_2 the consumer comes to equilibrium at point Q_2 which is just touching the curve No.2. At this position the consumer is able to purchase larger quantifies of x and than what he did before when he was at Q_1. With increased income, the consumer is able to catch up the higher in the difference curve and purchase larger quantities and thereby maximize his satisfaction. Suppose his income increases still further the price-line shifts to a still higher position denoted by P_3L_3. The consumer is in equilibrium at point Q_3 in IC_3. This means that the consumer has reaches a higher indifference curve than before and purchase still larger quantities of x and y and thereby gets greater satisfaction. We can draw conclusion that as the consumer's income increases (other things remaining the same) be switches to higher indifference curves and consequently enjoys higher levels of satisfaction.

The various equilibrium points Q_1, Q_2, Q_3 are connected together to get Income Consumption Curve (ICC). Thus, income consumption curve is the locus of equilibrium points at various levels of consumer's income. ICC traces the income effect on the quantities purchased.

The Substitution Effect on Demand

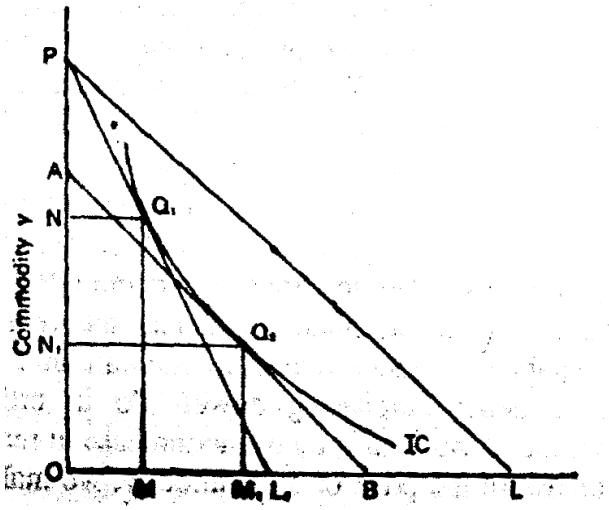
The Substitution Effect (Hicks-Allen Method)

Substitution Effect' means the change in the purchase of a commodity as a result of a change in relative prices alone, while the income of the consumer remains constant. We have studied the behaviour of the consumer towards purchasing of commodities in the context of increasing income without any change in the price of goods. Now, we have to study the behaviour of the consumer towards the purchases of commodities when the prices fall while his real income remains constant. The fact to be remembered here is that when the price of a commodity falls (though we keep the income of the consumer constant) the real income of the consumer automatically increases due to the fall in price and so, the consumer has a better purchasing power. So in order to keep the consumer's income constant in spite of the increase in real income arising out of the decrease in the price of a commodity, we make compensatory reduction an income so that the consumer as neither well - off nor worse - off in relation to his income. For example, when the price of the commodity of x falls, the real income of the consumer would increase. In order to find out the substitution effect, i.e., change in the quantity of x due to the change only in its relative price, the consumer money income must be reduced by an amount so as to cancel out the gain in real income that result from the decrease in price.

The substitution effect propounded by Hicks and Allen with the principle of compensating variation in income has come to be known as 'Hicks-Allen substitution effect' which makes the consumer remain in the 'same difference curve' and study his equilibrium point due to the price change. The substitution effect based on Hicks-Allen approach is illustrated in the Figure 8.24.

With given prices of two goods x and y and money income, the price-line PL1 is drawn and the consumer comes to equilibrium at point Q on the indifference curve (IC) and purchases, OM quantity of x and corresponding y, (ON). Suppose the price of x commodity falls but price of y remains constant. Consequently price-line shifts to the position PL as shown in the figure. With the fall in the price of x the consumer's real income or purchasing power increases. In order to study the substitution effect, this increase in real income should be nullified by correspondingly reducing the money income of the consumer by such an amount that forces him to remain on the same indifference curve IC on which he was before. When some money is taken away from the consumer to cancel out the

Figure 8.24



Commodity X

gain in real income, then the price-line which shifted to the position of PL would come down to the position of AR which is parallel to PL and this reduced price-line AB will be made tangency to the same indifference curve IC. This means that the consumer's real income has been reduced by the amount PA (in terms of y) or LB (in terms of x) which is just sufficient to nullify his gain in income due to a fall in the price of x. By making this compensatory variation in income of the consumer, we have made him come to the original indifference curve IC.

Now, with the new price-line AR representing the relative price of goods x and y he has found x cheaper and as such come to equilibrium at point Q_2 by rearranging his purchases. In the new equilibrium point (Q_2) he

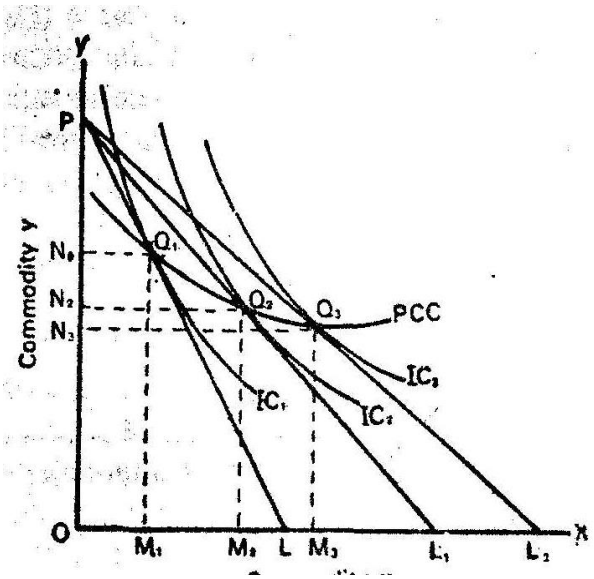
purchases more of x commodity than b-fore and less of y commodity. He has increased the purchase of x from OM to OM_1 quantities while he has reduced the purchase of from ON to ON_1 quantities. With the fall in the price of x, the consumer has substituted x commodity in the place of y commodity. In order to purchase more of x, the consumer has moved from the first equilibrium point Q_1 to the second equilibrium point Q_2. Therefore movement from Q_1 to Q_2 represents the substitution effect. Even though he is on the same indifference curve, he has moved to a different point of equilibrium. The consumer substitutes the cheaper commodity for a dearer one.

The Price Effect on Demand

The Price Effect – Price Consumption Curve

The effect of a change in price of a commodity on the quantity of its purchase is known as price effect. The price consumption curve traces the

Figure 8.26



Commodity X

price effect. In finding out the price effect, we study the change in the relative prices of the goods in question and other facts like the income of the consumer, his tastes and preferences and price of other goods remain at the same level. We do not make any compensating variation in the income of the consumer to make it constant. When there is change in price of a commodity in question, the consumer would be either better off, (if there is fall in price) or worse off (if there is rise in price) and accordingly he would shift to a higher indifference curve or lower indifference curve. The price effect is illustrated in Figure 8.26.

With given prices of two commodities x and y and given income of the consumer we have drawn the price-line PL. The consumer is in equilibrium at

Q_1 in IC_1 and makes purchases of x and y as denoted in the figure OM_1 and ON_1 respectively. Let the price of x fall. The income of the consumer is constant and there is no change in the price of y. With the fall in the price of x the price-line shifts to PL_1 and consequently the consumer can reach a higher indifference curve IC_2 with Q_2 as equilibrium position purchasing OM_2 quantities of x and ON_2 quantities of y. The consumer by shifting to a higher indifference curve reaches a higher level of satisfaction by making larger purchase of x and smaller purchase of y. Suppose the price of x falls still further, the income and the price of y remaining constant the price line shifts to PL_2 and the consumer comes to equilibrium in IC_3 at the point Q_3, where he purchases still 1arg quantities and lesser quantities of y.

When all the equilibrium points Q_1, Q_2, Q_3 are joined together by means of a curve, we get Price Consumption Curve (PCC). The course of this price consumption curve indicates the price effect on the consumption of the commodities under consideration. The price consumption curve given above slopes downwards showing that when the price of x commodity falls, the consumer purchases larger quantities of x and smaller quantities of y.

ELASTICITY DEMAND

Price elasticity of Demand

The change in quantity demanded due to a change in price is known as elasticity of demand or, more correctly, price elasticity of demand. If a given percentage change in price brings about a larger percentage change in quantity demanded, the demand for the product is said to be elastic. On the other hand, if a given percentage change in price brings about a smaller percentage change in quantity demanded, the demand for the product is said to be inelastic.

Thus price elasticity of demand may be defined as the change in the quantity demanded in response to a change in price of a commodity. The formula for calculating price elasticity is

$$E_p = \frac{\text{Percentage change in the demand for product A}}{\text{Percentage change in the price of product A}}$$

Kinds of Price Elasticity Demand

A small fall in the price of a product may lead to a considerable increase in the quantity demanded, but sometimes even a considerable fall in price may not lead to any increase in demand. The responsiveness of demand to small changes in price differs from product to product. There are five different relationships, possible between a change in price and the corresponding change in quantity demanded. These five different degrees of demand are:

Elasticity is unity. The change in demand is exactly equal to change in price, say, by 2 per cent in both cases.

$$E_p = \frac{\text{Percentage change in dd}}{\text{Percentage change in price}} = \frac{2\%}{2\%} = 1$$

in this case elasticity is one or unity.

Elasticity more than unity. The change in demand is more than change in price, say, 2% and 1% respectively. Then:

$$E_p = \frac{\text{Percentage change in dd}}{\text{Percentage change in price}} = \frac{2\%}{1\%} = 2$$

Whenever the elasticity coefficient is more than 1 but less than infinity elasticity is said to be more than unity.

Perfectly elastic. The change in demand is something positive even though the change in price is zero. Suppose that demand changes by 2% but the change in price is zero, then,

$$E_p = \frac{\text{Percentage change in dd}}{\text{Percentage change in price}} = \frac{2\%}{0\%} = 2 \text{ or Infinity}$$

Elasticity less than unity. The change in demand is less than change in price. Suppose, demand changes by 1% to a 2% change in price, then,

$$E_p = \frac{\text{Percentage change in dd}}{\text{Percentage change in price}} = \frac{1\%}{2\%} = \frac{1}{2}$$

In this example, elasticity is half or less than one. If the coefficient of elasticity is less than one, the demand for the product is said to inelastic.

Elasticity is zero. In case there is no change in demand, whatever be the, change in price we will have an absolutely inelastic demand. Suppose that the change in price is by 5% but the change in demand, is zero, then,

$$E_p = \frac{\text{Percentage change in dd}}{\text{Percentage change in price}} = \frac{0\%}{5\%} = 0$$

Measurement of Elasticity of Demand

Price Elasticity of Demand can be measured by three methods. They are:

i) Total expenditure or outlay method
ii) Measuring elasticity at a point
iii) Arc method.

I. Total expenditure or Outlay Method

In this method we find out the total expenditure on the quantity of commodity demanded and find out whether the total expenditure has increased or decreased or remained constant, consequent on the change in price. The Table 7.4 shows the behaviour of the total expenditure or revenue due to change in price of a commodity. Three demand schedules are combined in this Table. Each schedule has the same price, but the quantities are different.

Table 7.4

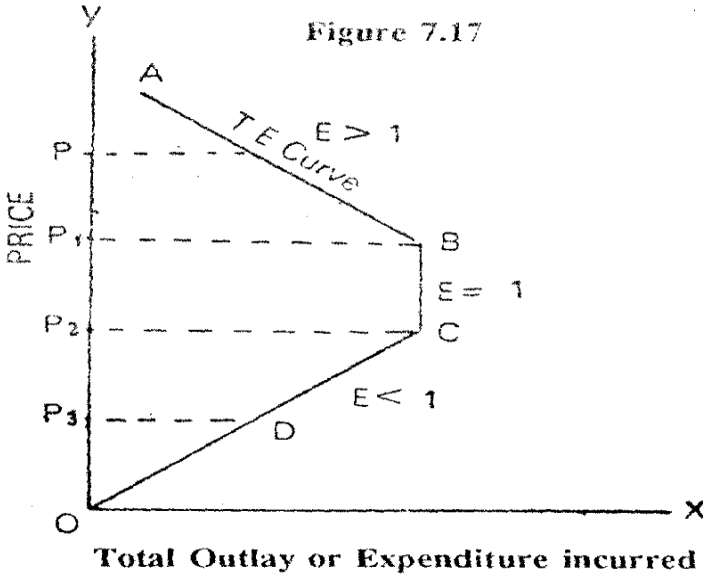
Demand schedules showing different elasticity's outlay method

Price in Rupees		Quantity demanded in units	Total Expenditure or outlay in Purchasing that quantity (in Rs.)	Elasticity
I	Rs. 6	1,000	6,000	Elastic
	Rs. 5	1,500	7,500	Demand
	Rs.4	2,000	8,000	E>1.
II	Rs. 6	1,000	6,000	Unit
	Rs. 5	1,200	6,000	Elasticity
	Rs.4	1,500	6,000	E=l
III	Rs. 6	1,000	6,000	Inelastic
	Rs. 5	1,100	5,500	Demand
	R. 4	1300	5200	E <1

In the first case, consequent on the fall in price from Rs. 6 to Rs.5 and then Rs.4 the quantities demanded have increased to 1,500 and 2,000 respective1y. The original outlay was Rs.6,000. Due to fall in price, the total outlay has gone up to Rs. 7,500 and Rs. 8,000 (outlay = Price × Quantity demanded). So when the total outlay increases due to fall in price the demand is elastic. In the second case, the total expenditure or outlay remains constant at Rs. 6,000 irrespective of changes in prices and in quantity demanded. The demand in this case is of unit elasticity. In the third case, the total outlay decreases with the fall in price. So, it has inelastic demand.

Measurement of Elasticity of demand through expenditure method can be indicated by a diagram. The behaviour of total outlay in response to changes in price reflects whether demand is elastic, inelastic or of unit elasticity curve. The Figure 7.17 considers three different price ranges and the behaviour of the total expenditure or outlay curves: Price has been taken on Y axis and total expenditure on the X axis. We consider three different price ranges, viz., OP to OP_1 : OP_1OP_2; and OP_2OP_3.

Figure 7.17



Total Outlay or Expenditure incurred

(i) The total outlay curve or expenditure curve slopes downward showing as the price falls the total expenditure is increasing. Conversely with a rise in price from OP1 to OP total expenditure diminishes as shown by the curve sloping to the left (AB portion of the curve). So the demand at this price range is elastic and E is greater than 1. (ii) Over the price range OP2, OP3 the total expenditure curve shows that as the price falls the expenditure decreases and as the price increases from OP3 OP2 the total expenditure increases showing that the demand is inelastic and e is smaller than I. (iii) In the price range P1 P2 the total expenditure does not change. The fall in price or rise in price keeps the total outlay constant as this part of the curve remains vertical to Y axis showing the total amount constant. Hence the elasticity is unity in the this price range and e =1. Thus we can infer elasticities by total outlay method.

So, in the total outlay or. expenditure method we can define or sum up elasticity of demand as follows:-

Elasticity of demand will be unity when the increase or decrease in a particular price range will not affect the total expenditure due to change in the quantities demanded. Elasticity will be more than unity or more elastic when the total outlay increases with the fall in price and decreases with rise in price in a particular price range. Elasticity will be less than unity or inelastic when the total outlay decreases with the fall in price and increases with a rise in price.

The drawback of this total expenditure method is that we may not know exactly the value of e in numerical terms. The classification can be simply made as elastic or inelastic or unitary demand.

II. Measuring Elasticity at a Point (Geometrical Method)

The total outlay methods as well as point elasticity method through geometrical means have been suggested by Alfred Marshall. We shall discuss the geometrical method of measuring elasticity at a point.

In order to find out the elasticity of demand at a point K on the demand curve DD, we have to take another point K1 just below K on the same demand curve. The assumption is that points K and K1 on the demand curves are so close that they can be joined by means of a siraightline which cuts' the X and Y axes at T and t respectively.

This has been illustrated in the figure 7.18 and 7.19

According to the enlarged figure 7.19 when the price falls from OP to 0P1, the quantity demanded increases from OQ to OQ_1. Using the formula elasticity of demand E Proportionate change in the quantity demanded + Proportionate change in the price, we get the following equation from the figure.

$$E = \frac{OQ_1}{OQ} + \frac{PP_1}{OP}$$

$$= \frac{RK_1}{OQ} + \frac{RK}{QK}$$

$$= \frac{RK_1}{OQ} \times \frac{QK}{RK}$$

$$= \frac{RK_1}{RK} \times \frac{QK}{OQ}$$

OQ_1 : Change in quantity

OQ : Original quantity

PP_1 : Change in Price

OP : Original price

Figure 7.19

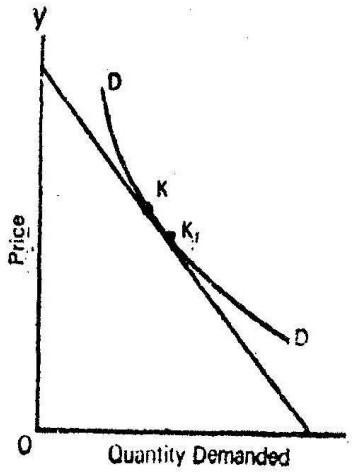
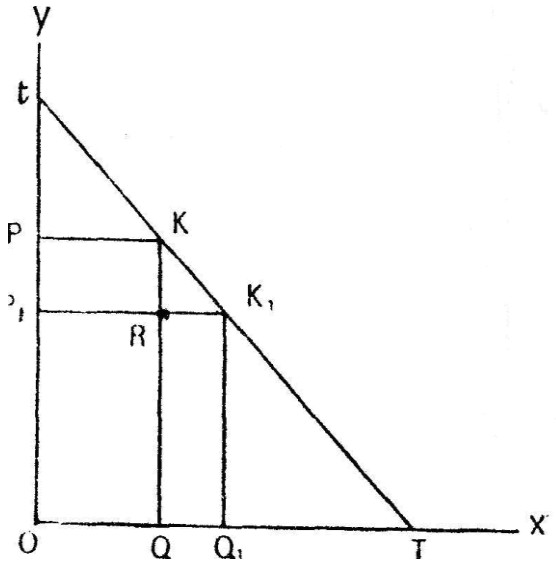


Figure 7.18



In the figure, triangle KRK_1 is similar to triangle KQT and therefore we can substitute $\frac{RK_1}{RK}$ by $\frac{QT}{QK}$. We can rewrite the equation as:

$$E = \frac{QT}{QK} \times \frac{QK}{OQ}$$

Canceling QK on both sides, we get

$$E = \frac{QT}{QK}$$

Assumption: As already pointed out, the demand curve is drawn on certain assumptions. We have taken a very small change in price and quantitities and so points K and K1 on tT lie very dose so as to almost coincide.. If this be the assumption, then QK should coincide with Q_1 K_1 and in the right angled triangle tOT the relation can be expressed as Since TK is the lower sector of the demand curve at this point and Kt its upper sector, we can say that in a demand curve at any point

$$\text{Elasticity} = \frac{\text{Lower sec tor}}{\text{Upper sec tor}}$$

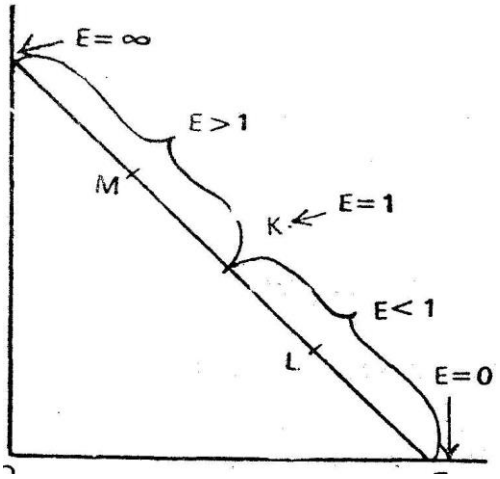
So on the demand curve DD, the elasticity of demand at point K. would be shown as below:

$$\text{Elasticity at Point K} = \frac{KT}{Kt}$$

In order to find out the elasticity of demand at any point on the demand curve, draw a tangent to that point in the demand curve so that the tangent may cut the axis on both sides X and Y. Elasticity of demand can be calculated by

finding the length of upper segment (sector) and lower segment, i.e., $\frac{\text{Lower sec tor}}{\text{Upper sec tor}}$ will give the value of E.

Figure 7.20



Quality demand

If we take a straight line demand curve tT as shown in Figure 7.20 the mid-point of the curve will indicate unit elasticity as at that point upper and lower sectors are equal.

Point K in this straight line demand curve is exactly at mid-point. Since the value of E= $\frac{\text{Lower sec tor}}{\text{Upper sec tor}}$ the value of E=1. Any point below K, say L in the figure will show inelastic demand' as the value of E will be less than one. Similarly any point above K, say M will show elastic demand as the value of E will be more than one. At the point where the demand curve touches the X axis, the value of E =0 and at the point where the demand curve touches the Y axis, the value of E = ∞ (infinity).

We can sum up by saying that Elasticity of demand at a point K on a demand curve can be found out by drawing tangent at K on the demand curve and measuring the tangent. By using the formula

$$E = \frac{\text{Lower Sector of the tan gent}}{\text{Upper Sector}}$$ we can calculate Elasticity. If it is a straightline demand curve, the mid-point shows unit elasticity and any point towards the right of mid-point shows inelastic demand. The point where the straight line demand curve touches X axis, the elasticity is zero; where the line touches Y axis, the elasticity is infinity.

III. Arc Method of Finding Elasticity of Demand

The point method of elasticity of demand studied above refers to conditions where the price change and change in quantities demanded are very small so that we can find out the elasticity at a point. Here we do not consider large changes in price or quantities in the calculation of elasticities. Since the

change is very litle, we take the original price and quantity as the basis of measurement. Suppose, the change in price and quantities is very large, the initial price and quantity cannot be taken as the basis of measurement. Nor the final price and quantities can be taken as the basis of measurement.

An example given in Table will illustrate the point.

Price	Quantity Demanded In Units
Rs. 30	200
Rs. 20	400

In this schedule, the initial price is Rs.30 and quantity 200 units. Final price or changed price is Rs.20 and the corresponding quantity is 400 units. Suppose we take the initial price as the basis of calculation of elasticity, then according to formula

$$E = \frac{\text{Proportional change in the quantity}}{\text{Proportionate change in price}}$$

$$\text{we get } E = \frac{200}{200} + \frac{10}{30}$$

$$E = \frac{200}{200} \times \frac{30}{10} = 3 \quad \text{Elasticity of demand} = 3$$

Instead, suppose we take the final price and quantity of demanded, then according to the equation we get the Elasticity -

$$E = \frac{200}{400} + \frac{10}{40}$$

$$E = \frac{200}{400} \times \frac{20}{10} \qquad \text{Elasticity} = 1$$

Now we find there is wide difference in elasticity if we take initial price or final price. If we take initial data the elasticity is shown as 3 while if we take final data the elasticity comes to 1. So the problem arises about the basis of calculation if the change in price and quantities is large. Definitely, the point method will be misleading. Hence economists have devised measurement of elasticity over an arc of the demand curve instead of a point on the demand curve. In measuring the arc elasticity of demand, the formula used for point elasticity cannot be applied as this takes only the initial price and quantity as the basis. Since we have to study the elasticity over an arc of change, we have to take into consideration the initial as well as final data regarding price and quantity. For this we take the average of the two figures, viz., and average of the two quantities, initial and final quantities of demand.

With the average of the two we construct a formula as follows:

$$\text{Elasticity of demand} = \frac{\dfrac{\text{Original quantity} - \text{New quantity}}{\text{Original quantity} + \text{New quantity}}}{\dfrac{\text{Original price} - \text{New price}}{\text{Original price} + \text{New price}}}$$

With the help of the new formula, we can find out the numerical value of E for the figures given in the schedule under study.

$$\text{Elasticity of Demand} = \frac{\dfrac{200-400}{200+400}}{\dfrac{30-20}{30+20}}$$

$$= -1.66$$

From the Arc Elasticity, we find that elasticity is 4.66 and it is neither 1 nor 3. The formula for arc price elasticity based on the figure 721 given will be as follows: To measure Arc Elasticity between points K and L on the Demand curve DD the formula will be:

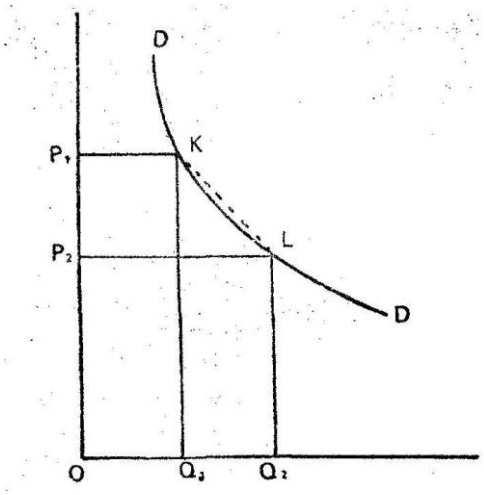
$$E_p = \frac{\Delta q}{\left(\frac{q_1+q_2}{2}\right)} + \frac{\Delta p}{\left(\frac{p_1+p_2}{2}\right)}$$

$$= \frac{\Delta q}{\left(\frac{q_1+q_2}{2}\right)} \times \frac{\left(\frac{p_1+p_2}{2}\right)}{\Delta p}$$

$$= \frac{\Delta q}{\left(\frac{q_1+q_2}{2}\right)} \times \frac{p_1+p_2}{\Delta p}$$

$$E_p = \frac{\Delta q\left(p_1+p_2\right)}{\Delta p\left(q_1+q_2\right)}$$

Figure 7.21



Factors Influencing Elasticity of Demand

There are many factors on which the elasticity of demand depends. These factors influence the elasticity of demand of a commodity either individually, or cumulatively.

(i) Nature of the commodity:

Why is it that demand for some goods is elastic while the demand for others is inelastic? It mainly depends on the nature of the commodity and the degree of necessity. The elasticity of demand depends on whether a commodity is necessity, comfort or luxury. Normally the demand for necessaries of life such as rice, wheat, salt etc., will be inelastic as these are essential for existence. So, everyone will demand a minimum quantity whatever be the price. On the other hand, the demand for comforts and luxuries may not have inelastic demand. When the prices of these fall, generally, more of the commodities will be demanded. In this discussion we should remember that there is nothing inherent the quality of a commodity to be called necessity or comfort or luxury. Even in necessities, commodities having substitutes will have elastic demand and commodities having no substitutes will have inelastic demand. Though wheat is a necessity as food for people, a rise in price may make the consumers go in for other cereals. This is not the case with salt which has no substitute. So, the demand for wheat may not be so inelastic as that of demand for salt; Further in the case of luxuries, it should not be concluded that the elasticity of demand for luxuries will be always large. It depends on the type of luxury. 'For instance diamonds and articles of jewellery are luxuries used by richer classes. Any minor changes in prices will not affect its demand as these commodities are demanded, only by richer people. So much so, we should make it clear, that the elasticity of demand may vary from commodity to commodity and also from group to group. What is luxury to one group may be comfort for another group and necessity for yet another group. Hence the elasticity on the basis of nature of commodity can be studied only on a comparative

(ii) Uses of the commodity:

If a commodity has only one use, a change in price will not affect the demand much and so it will have inelastic demand. If the commodity has a number of uses, change in price will affect the demand for the commodities in many uses. When a commodity is put to various uses, it will have elastic demand. If the price of that commodity is increased, the commodity will be demanded y in essential uses, and in other uses, substitute materials will be utilized. For instance, a fall in price of coal may make everyone including the householders to demand coal and the demand will be elastic. A rise in price will result in the curtailment of the purchase and householders will shift to either firewood or oil. Here too, the statement that a commodity having several uses will have elastic demand has to be understood with a restrictive sense. For example coal will have elastic demand in houses but inelastic demand in Railways.

(iii) Existence of substitutes:

Commodities having substitutes will have elastic demand and goods with no substitutes will have inelastic demand. When the price of a commodity rises, the people would shift their preference to substitute commodities and demand the substitutes with the hope that the price of substitutes will not rise. Consequently the demand will fall heavily for the commodity for which the price has been increased. Suppose the commodity does not have substitute at all like salt, any change in price will not affect the demand and so the demand will be inelastic. Examples of coffee and tea or different kinds of drinks can be cited to illustrate this point. A rise in the price of coffee would make the people demand tea which is a fair substitute for coffee. Similarly, if the price of coffee comes down, people using other hot drinks will shift to coffee and the demand for coffee will go up. So also is the case with different brands of cigarettes. The demand for a particular brand of cigarette will be elastic as there are many brands of cigarettes for the consumers to choose.

(iv) Postponement of Demand:

Another important factor affecting the demand in a bigger way is whether the demand for a commodity can be postponed or not. If the demand can be postponed, then the commodity will have elastic demand. If the demand cannot be postponed, it will have inelastic demand. The demand for rice or medicines cannot be postponed while the demand for mangoes, oranges and apples can be postponed, if the prices of these rise. Hence demand for rice, and medicines will be inelastic, and the demand for fruit will be elastic, that is more will be purchased when the prices come down. The postponement of demand, is only a corollary of the kind or nature of commodities already discussed. In the case of necessities, the demand cannot be postponed and so demand becomes inelastic. In the case of commodities, which are not necessities, demand can be postponed and so the demand becomes elastic.

(v) Amount of Money Spent:

Elasticity of demand for a commodity also depends on the proportion of consumer's money spent on the commodity. If the consumer spends only a little amount on the consumption of a particular commodity, the demand for that will be inelastic. In every household the money spent on salt and match-boxes will be very small compared to the amount in the total budget of family expenditure. Let us suppose a family spends 25paise on match-sticks every month from the total expenditure of Rs.500 for the family. Even if the price of match-sticks rises by 50 per cent the demand will not be curtailed, not because the commodity is very essential, but because the money spent on the commodity is so small and the extra outlay due to increase in price will be very negligible. So, the demand for it will be inelastic. In the case of items like clothing or food the consumer spends a large proportion of his income and therefore any increase in price will result in sizably increasing his total expenditure. So to keep himself fairly within his means, the consumer will reduce the quantity purchased. The demand for these commodities will be elastic.

vi) Habits:

If the consumers are addicted to some habits and customs, then the demand of the commodity will be inelastic. For instance people addicted to smoking a particular brand of cigar will not change the quantity demanded whatever be the change in price. So is the case with the people using tobacco in different forms, viz., chewing, snuffing, etc., But if the rise in price persists for a long time, even addicts would try to reduce the demand either by resorting to some alternative substitutes or curbing the habit. Generally, commodities and drugs which are stimulants will have inelastic demand.

vii) Range of Prices of commodities:

Elasticity of demand for a commodity depends on the range of prices at which the commodity is sold in the market. At a very high range of prices, the demand will be inelastic, so also at-a very low range of prices, the demand will be inelastic.

Income And Cross-Elasticities Of Demand

Though the demand for a product depends upon its price, it is equally true that demand is influenced by changes in the incomes of consumers. The responsiveness or degree of change in demand for a product as a result of change in income is known as income elasticity. The formula for income elasticity is:

$$E_y = \frac{\text{Percentage change in demand for a product}}{\text{Percentage change in income}}$$

Suppose that the money income of a consumer increases by 10 per cent and as a result of this increase in his income the amount demanded commodity increases by 20 per cent then the income elasticity will be $\frac{20\%}{10\%} = 2$. Here

income elasticity for the commodity may be considered as high. If in the case of another commodity 10 per cent in consumer's money income is accompanied by a very small percentage increase in the amount demanded of that commodity, 2 per cent, the income elasticity of demand will be $\frac{20\%}{10\%} = \frac{1}{5}$ or 0.2. Income elasticity of demand in this case is low.

Normally, the income effect for a commodity is positive (except in the case of inferior goods) and consequently income elasticity of demand is also positive. This means that a change in a consumer's money income and in his expenditure on any commodity will usually be in the same direction.

Just as we differentiated between five different kinds of price elasticity of demand, we can also distinguish between as many different incomes elasticities of demand.

(i) **Zero income elasticity of demand.** This occurs when a given increase in consumer's money income fails to lead to any increase in the amount demanded of the commodity in question.

(ii) **Negative income elasticity of demand.** This is witnessed when an increase in consumer's money income is accompanied by a fall in the amount of goods purchased. This is true in the case of inferior goods.

(iii) **Unitary income elasticity of demand**. In this situation the proportion of the consumer's income spent on the goods in question is exactly the same both before and after the rise in income.

(iv) **Income elasticity of demand is greater than one**. The consumer spends a greater proportion of his money income on the commodity as he becomes richer.

(v) **Income elasticity of demand is less than one.** This occurs when the proportion of consumer's money income spent on the commodity in question falls as his income increases. This is true of necessaries, the expenditure on which does not increase proportionately with increase in consumer's money income. For all practical purposes, it is sufficient if we think of only three kinds of income elasticities of demand, viz,;

(a) Zero income elasticity of demand.

(b) Negative income elasticity of demand.

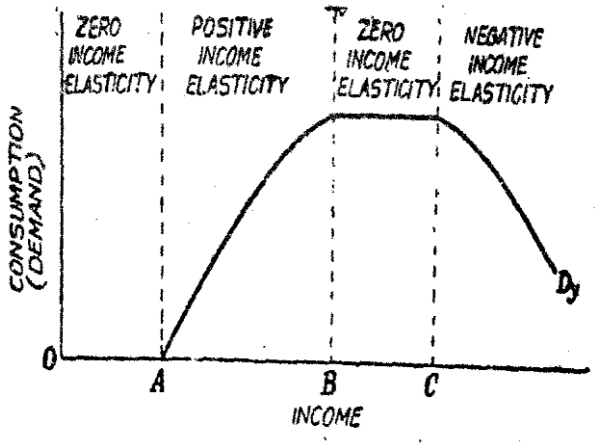
(c) Positive Income elasticity of demand.

In Fig. 15, the horizontal axis represents the income of the consumer and the vertical axis represents demand for terylene cloth. You may observe that:

(a) There is no demand for terylene when the consumer has increase up to OA, that is, an increase in income from 0 to A

will not lead to any increase in consumption of terylene cloth. The income elasticity of demand for terylene cloth is zero for income OA.

(b) Between income A and B the increase in incomes is accompanied by an increase in demand for terylene cloth. Income elasticity is positive between this range of income. The maximum demand for terylene is at B income.



(c) Between B and C incomes, there is no increase in consumption of terylene. In this range, an increase in income is not accompanied by the increase in the demand for terylene income elasticity, there fore, is zero.

(d) Beyond C income, the demand for terylene declines as the consumer shifts his demand to other superior goods. After this income range the income elasticity of demand is negative.

If terylene is the best available fibre and the consumer will not shift to any other commodity income-demand curve (Dy) will not bead after income OC but will continue to be horizontal, parallel to the X-axis.

Cross-Elasticity of Demand

The degree of' change in demand for a product A as a result of a change in the price of product B is known as cross-elasticity of demand. Cross-elasticity of demand reflects how the demand for a product depends on the prices of other related products. The formula for cross elasticity of demand is

$$E_c = \frac{\text{Percentage change in demand for product A}}{\text{Percentage change in price of product B}}$$

Goods are related in two ways; they are either complementary or substitutes, if A and B are complementaries, the demand for A and B will go together. If the price of B falls and accordingly the demand or B increases, the demand for A will also increase. In this case, cross elasticity of demand will be

negative. If, on the other hand, A and B are substitutes, a fall in the price of B and a consequent increase in demand for B will be followed by a decline in demand for A cross- elasticity of demand will be positive. In the case of perfectly complementary goods, cross-elasticity will be minus infinity, and in the case o perfect substitute it will be plus infinity. In case A and B are not related at all (consequently a change in price of one will not affect the demand for the other) cross-elasticity of demand will be zero.

NOTES

NOTES

UNIT - III

ELASTICITY OF SUPPLY

1. Definition of Elasticity of Supply

Alfred Marshall developed the concept of elasticity of supply. Price elasticity of supply is defined as the responsiveness of quantity supplied of a commodity to changes in its own price. The value of elasticity of Supply will give the degree or quantity of change in supply to a change price. It is calculated as:

$$e_s \text{ or } E_s = \frac{\text{Percentage change in quantity sup plied}}{\text{Percentage change in price}}$$

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

e_S = Coefficient of price elasticity of supply. It is independent of units.

P = Initial price of the good

Q = Initial quantity supplied.

ΔQ = Change in quantity supplied

ΔP = Change in price

The positive sign indicates that price and quantity supplied of a good are positively related, i.e., greater units of the good will be placed in the market only at higher prices and vice versa.

2. Determinants of Elasticity of Supply

The important factors affecting price elasticity of supply are:

(i) Time factor: The longer the time period, the more elastic is the supply curve.

(ii) Nature of the good: Inelastic supply in case of perishable goods because its supply can neither be increased nor decreased within a short period.

(iii) Production capacity: If unlimited production capacity exists (i.e., production can be increased easily), then there is elastic supply. If limited production capacity exists, then there is inelastic supply.

(iv) Production methods and techniques: If an industry uses complicated methods and techniques of production, supply of the commodity produced by that industry will be relatively inelastic, On the contrary, if an industry uses simple methods and techniques of production, supply of the commodity produced by that industry will be relatively elastic.

(v) Stage of laws of return: If the law of diminishing return is applied on the production of a commodity, elasticity of supply for such a commodity will be inelastic. On the contrary, if the law of increasing return is applied on the production of a commodity, supply of such a commodity will be elastic.

(vi) Future price expectation: If the producers expect that the price will rise in future then they will supply less quantity in the market presently.

Thus, supply will become inelastic. If the producers expect that the price will fall in the future, supply will be more elastic. .

(vii) Number of products being produced by an industry: If an industry is producing many products, supply is elastic as the producers can switch over to the production of other goods and vice versa.

A summary of the factors affecting elasticity of supply is given in Table 4 1.

Table 4.1 : Determinants of Elasticity of Supply

	Factors	E_s is more when
1.	Time factor	More time is available
2.	Nature of the good	Durable goods are available.
3.	Production capacity.	Unlimited production capacity exists.
4.	Production techniques.	Production techniques are simple.
5.	Stage of laws of return.	Law of increasing return is applicable.
6.	Future price expectation.	It is expected that price will fall in the future.
7.	Number of products being produced by an industry.	Industry is producing many products.

Different Types of Elasticity of Supply

There are five degrees or types of elasticity of supply. They are summarised in Table 4.2.

Table 4.2 : Values of Elasticity of Supply

	Coeff. Of e_s	Types of e_s	Description	Shape of supply Curve
1.	$e_s = 0$	Perfectly inelastic supply	This occurs when to a percentage change in price there is no change in quantity supplied.	Vertical (S_3N)
2.	$O<e_s<1$	Inelastic (or less than unitary elastic supply)	This occurs when to a percentage changes in price there is lesser change in quantity supplied	Upward sloping originating from x-axis (S_2D)

3.	$e_s = 1$	Unitary elastic supply	This occurs when to a percentage changes in price there is equal change in quantity supplied	Upward sloping originating from origin (OC)
4.	$1<e_s<\infty$	Elastic (or more than unitary elastic)	This occurs when to a percentage changes in price there is more than proportionate change in quantity supplied	Upward sloping originating from y-axis (S_1B)
5.	$e_s = \infty$	Perfectly elastic supply	This occurs when there is infinite change in quantity supplied at a price.	Horizontal (SA)

Graphically, the five coefficients of price elasticity of supply are shown in Fig. 4.1

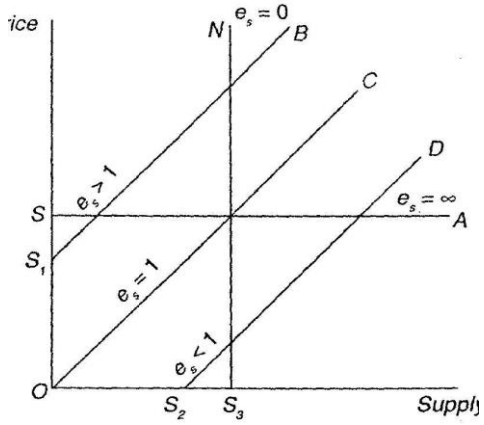


Fig 4.1. Different types of Elasticity of supply

The details of each coefficient of elasticity of supply is as follows:

1. Perfectly inelastic supply ($e_s = 0$) When supply of a commodity does not change irrespective of any change in its price, it is called perfectly inelastic supply. In this case, $e_s = 0$.

2. Inelastic (or less than unit elastic) ($0 < e_5 < 1$): When percentage change in quantity supplied is less than percentage change in price supply is said to be inelastic or less than unit elastic. This is shown in Fig. 4.3.

Fig 4.3. Inelastic supply curve.

The inelastic supply curve is S_2D which is upward sloping originating from the x-axis.

3. Unit elastic supply ($e_s = 1$): Supply of a commodity is said to b unit elastic if percentage change in supply equals the percentage change in price. In this case, the coefficient of e_s is equal to one. It is shown in Fig. 4.4.

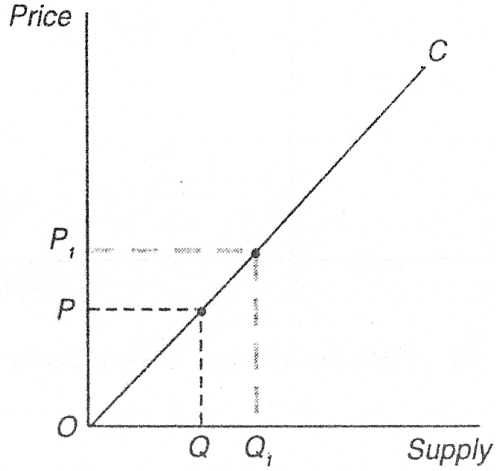


Fig. 4.4 Unitary Elastic Supply Curve

The unitary elastic supply curve is OC which is a straight positively sloping line from the origin.

4. Elastic or (more than unit elastic supply) ($1 < e_s < \infty$) : When percentage change in supply is more than the percentage change in price, supply is said to be elastic or more than unit elastic. In this case, the value of the e_s is more than one. It is shown in Fig. 4.5.

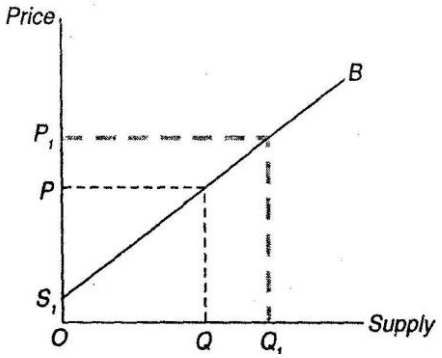


Fig. 4.5 Elastic Supply Curve

The elastic supply curve is S_1 B which is upward sloping originating from the y- axis.

5. Perfectly elastic supply ($e_s = \infty$) Supply of commodity is said to be perfectly elastic when its supply expands (rises) or contracts (falls) to any extent without any change in the price. The coefficient of $e_s = \infty$ (infinity). It is shown numerically in Fig.4.6.

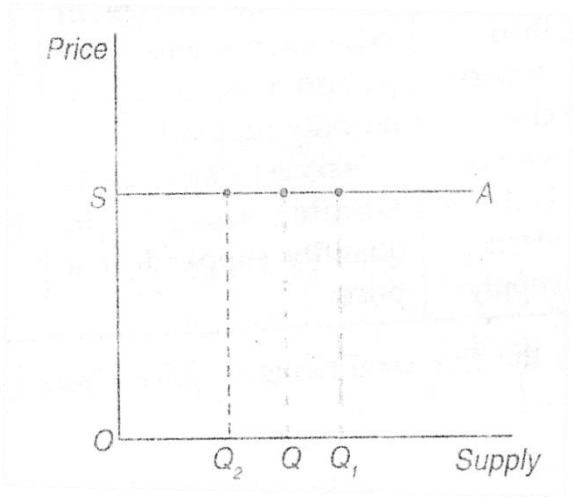


Fig. 4.6 Perfectly Elastic Supply Curve

The perfectly elastic supply curve is SA which is a horizontal line. It shows that at a price of OS per unit, any quantity of the commodity can be supplied.

COST AND COST CURVES

Total cost, variable cost and fixed cost curves

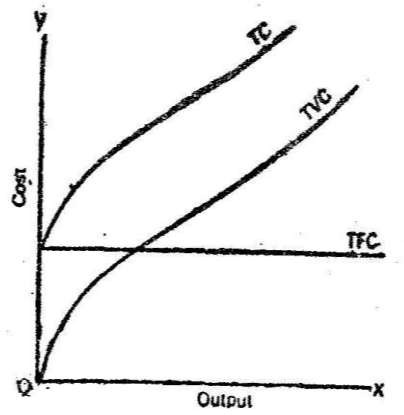
We have already seen that the total cost of the firm will increase with the increase in output. The total variable cost will also increase with the increase in output. The total fixed cost will be constant whatever be the output. The figure 15-1 illustrates the behaviour of the different costs mentioned and the relationship between them.

TC = Total Cost curve

TVC = Total Variable Cost curve

TFC = Total Fixed Cost curve

Figure 15-1



The total fixed cost is constant and it refers to the entire obligation of the firm per unit of time for the fixed resources. This curve is parallel to x axis showing that it is constant regardless of output per unit of time. From the figure, we can see that the total fixed cost curve starts from a point on the y axis. This means that the total fixed cost will be incurred even if the output is zero. The curve indicating TVC, rises as the firm's output increases since larger output require larger quantities of variable factors. The TVC curve increases with an increase in output though the rate of increase is not constant. At first it increases rapidly, then it increases at a diminishing rate and beyond a point it increases at an increasing rate. The TVC starts from the origin showing that when output is zero the variable cost is also nil. The total cost is the result of variable and fixed costs. The TC curve lies above TVC curve by an amount equal to TFC at all output levels. It can also be seen that the TC and TVC curves have the same shape since each increase in output per unit of dine increases total cost and variable cost by the same amount as the TFC is constant at all levels.

The short period total cost can be mathematically expressed. The total cost is the function of total output Greater the output, the greater will be the total cost. In symbols:

$$TC=f(q) \quad \ldots\ldots\ldots I$$

We have already seen that total cost is equal to total fixed cost and total variable cost.

TC = TFC + TVC. in this equation TFC is constant. This can be taken as K. So,

$$TC=K+TVC \ldots\ldots \quad II$$

TVC is equal to the amount used of the variable factor. Suppose L amount of variable factor is used at the given price of W, then, TVC = LW. From this we can write the above equation as:

$$TC=K+L.W \quad III$$

Now LW, that is TVC must rise with increase in output because only by increase in the amount of variable factor (L) the output can be increased. From the equation III it follows that with the increase in LW, as output rises, TC must also rise. Thus TC is the function of total output (q) and varies directly with it.

Average fixed and variable costs (short run)

The concept of costs has more significance only in the context of per unit cost of production rather than total costs. The per unit costs are: the average fixed cost; the average variable cost: the average (total) cost and the marginal cost.

Average Fixed Cost (AFC) is the total fixed costs divided by the number of units of output produced. It can be stated that AFC = TFC/q Where q represents the number of units of output produced. The average fixed cost is the fixed cost per unit of output. The greater the output of the firm, the smaller will be the average fixed cost. Since TFC remains constant irrespective of output, the fixed costs are spread over when more units are produced and consequently each unit of output because a smaller share. The AFC diminishes as the output increases. The AFC curve is a downward sloping curve to right throughout its entire length and it is always a rectangular hyperbola since AFC and quantity produced are constant.

Average Variable Cost (AVC) refers to the variable cost per unit of output. It is the total variable cost divided by the number of units of output produced. Therefore, AVC = TVC/q where q is the total output produced. The AVC curve wil1 be able cost will fall as the output increases from zero to the normal capacity output due to the operation of increasing returns. But beyond the normal capacity of output, the average variable cost will rise up steeply due to the operation of diminishing returns.

Average Total Cost (ATC) is the sum of average fixed cost and the average variable cost. When output increases and average fixed cost becomes smaller and smaller vertical distance between the average total cost curve (ATC) and the average variable cost curve goes on declining. When AFC approaches the x-axis, the AVC curve approaches the average total Cost Curve

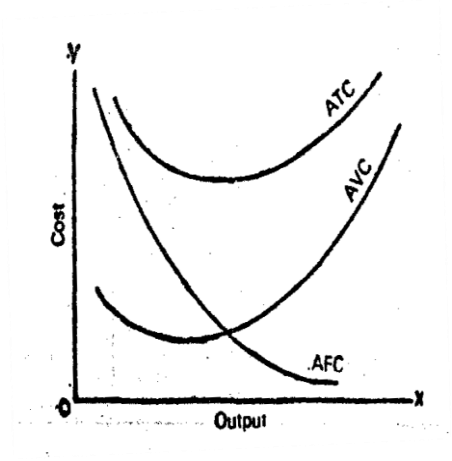
The average total cost is simply called Average Cost which is the total cost divided by the number of units output produced.

Average Total Cost = Total Cost/ Quantity of Output t =TC/q

We know that total cost is the sum of TFC and TVC and average total cost is the sum of AVC and AFC.

Average total cost is equal to average variable cost plus average fixed cost. The Average total cost, i.e., average cost is also known as the unit cost since it is the cost per unit of output produced. The Figure 15-2 shows the shape of AFC, AVC and ATC in short-run period.

Figure 15-2



From this we can understand that the behaviour of ATC curve depends upon the behaviour of AVC and AFC curves. In the beginning both AVC and AFC fall. So ATC curve also falls. When AVC curve begins rising, but AFC curve is falling steeply, the ATC curve continues to fall. Because during this stage the fall of AFC is heavier that the rise in AVC. But as output increases further, there is a sharp increase in AVC which more than offsets the fall in AFC. Therefore the ATC curve rises after a point. The ATC curve like AVC curve falls first, reaches the minimum value and then rises. Hence it has taken a U shape.

Marginal Cost

Marginal cost may be defined as the addition made to the total cost by the production of one additional unit of output. This means marginal cost is the addition to the total cost of producing n units instead of n - 1 unit where 'n' is any given number. Thus, when 10 units of output are being produced, the marginal cost would be equal to the total cost of producing 10 units minus the total cost of producing 9 units. Suppose the total cost of producing 9 units is Rs. 450 and the total cost of producing 10 units is Rs. 510, then the marginal cost is Rs. 60. By increasing the output from 9 units to 10 units, the marginal cost incurred in Rs. 60. The firm has incurred a sum of Rs. 60 in the production of one more unit of the commodity. Symbolically we may denote marginal cost thus:

$Mc = Tc_n - Tc_{n-1}$ unit

Table 15-1

Computation of Marginal Cost

Output (1)	Total cost (2)	Marginal cost (3)
0	200	-
1	250	50
2	290	40

3	320	30
4	360	40
5	412	52
6	472	60
7	546	74
8	646	100

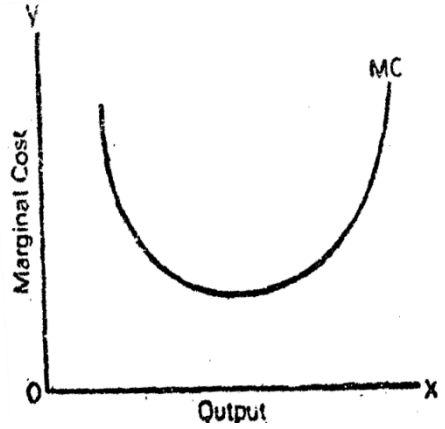
We can compute marginal cost from the table of total cost and output.

The table 15-1 gives output and total cost for different units produced and
in the third column the marginal cost has been calculated.

According to the table, when the output is zero in the short run the total cost is Rs.200 This amount represents total fixed cost of production which has to be incurred even if there is no output. When one unit of the commodity is produced, the total cost comes to Rs. 250. The marginal cost of the first unit produced therefore, is Rs.50. When the Output is increased to 2 units, the total cost goes up to Rs. 290 from Rs.250. So the marginal cost of production for the second unit output is Rs.40 i.e. Rs.290 — 250. In this way the marginal cost of production for different units added to the production has been calculated and given in the column. From the nature of the marginal cost, we find that initially marginal cost decreases when the outputs increased, From Rs.50, it falls to Rs.40 and then to Rs.30. After reaching this minimum level at the third unit of product ion, the marginal cost increases with the increase in output, From Rs.30, it increases to Rs.40, Rs.52, Rs.60 etc. We can draw the marginal cost curve by taking the output on the x axis and marginal cost on the ‘y’ axis. The shape of the curve will be a ‘U’ one showing that marginal cost declines first and afterwards increases.

The marginal cost curve figure 15-3 is given below:

Figure 15.3



Three very important points are to be remembered in the analysis of cost.

(i) The shape of the cost curve is determined by the law of variable proportion. If 'increasing' is in operation, the marginal cost curve declining as the cost will be decreasing with the increase in 'output the 'diminishing returns' is in operation, the MC curve will be ascending, as it is a situation of increasing cost.

(ii) The changes in the marginal cost is due to changes in the variable cost when the output is increased or decreased and MC is independent of Fixed cost. It is only the increase in variable cost which will cause increase in the marginal cost and decrease in variable cost will cause decrease in marginal cost.

(iii) The price of the variable factor remains constant as the firm expands its output. Otherwise a change in factor price may disturb our conclusions.

The independence of Marginal cost from the fixed cost can be proved as follows:

Marginal cost is a change in total cost due to a small change in the output. So,

$$MC = \frac{\Delta TC}{\Delta Q} \qquad .....(l)$$

ΔTC represents change in total cost.

ΔQ represents a small change in output or total product.

We have already stated that

$$MC_n = TC_n - TC_{n-1} \qquad .....(II)$$

$$TC_n = (TVC_n + TFC)$$

$$TC_{n-1} = (TVC_{n-1} + TFC)$$

So,
$$MC_n = (TVC_n + TFC) - (TVC_{n-1} + TFC)$$
$$= TVC_n + TFC - TVC_{n-1} - TFC$$
$$MC_n = TVC_n - TVC_{n-1}$$

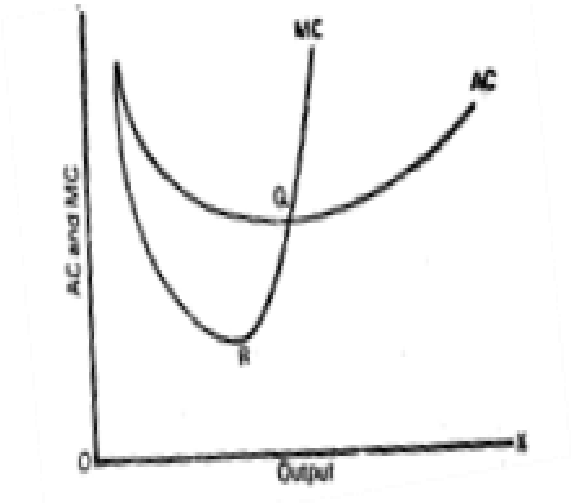
Equation I indicates that the marginal cost is the result of change in total cost due to change in output. Equation II indicates that marginal cost is the difference in total cost between the production of 'n' units and 'n-1' units. Though fixed cost is included in the total cost, equation III shows that the marginal cost is unaffected by fixed cost and it is the addition to the total variable costs when the output is increased by one unit. From this, we can conclude that the Marginal cost is independent of fixed cost and an increase in marginal cost is due to increase in variable cost. Since fixed costs do not change with output, there are no marginal fixed costs : when the output is increased in the short period It is only the variable costs that vary with he output in the short period. Therefore Marginal costs are the results of changes in variable costs.

Relationship between MC and AC

The relationship between Marginal Cost Curve and Average Cost Curve is unique. The relation between these two is more a mathematics one rather than economics, accordingly the two curves should start from the same point as the MC and AC of a very small output must be the same. Both the marginal and average curves will decline but the Mc declines Steeply at a greater rate than the latter. After a certain stage, both cost rise and the marginal cost curve rises steeply while AC will rise smoothly. The MC curve cuts the AC curve from below at the lowest point of the latter.

The figure 15-4 Shows the position of Average Cost Curve and Marginal Cost Curve in the short-run.

Figure 15-4



From this figure, we find that when the short run Marginal Cost Curve lies below the Average Cost Curve, the Average Cost Curve is falling When MC lies above the AC, the AC is rising. At the point of Q where AC and MC meet, both are equal and AC is neither falling nor rising. The point Q where MC curve crosses the AC curve, is the minimum point of the AC that is MC curve cuts the AC curve at the latter's minimum. From this we conclude that when Average Cost is falling, the marginal cost will be below it.

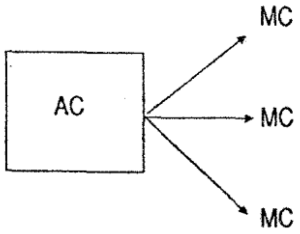
But the marginal cost may be raising or fall in when it is below the average cost.

When AC is raising MC is also raising. In the figure, though MC s raising between R and Q, it is below AC. After 'Q' When AC is raising Mc is also raising.

The relationship between the MC and AC is that when marginal cost is less than average cost, the average cost wilt fall and when marginal cost is greater than average cost, the average cost rises. This can be illustrated in an example. Suppose the average mark of, a student in 6 examinations is 50%. In the next examination if he scores less than 50, say, 40 marks, the average will fall because the marginal (additional) score has fallen. If he scores in the additional examination more than 50, say, 60, then the average mark will

increase because the marginal (additional) mark is greater than his previous average mark. Suppose, he scores exactly 50 in the additional examination, the average will remain the same. In the same way, suppose a producer is producing a certain number of units of a product and his average cost is Rs. 50, and if he produces one unit more and his average cost falls, this means that the additional unit produced must have cost him less than Rs. 50. On the other hand, if the production of the extra unit raises, his average cost will increase. Suppose the average remains at the same Rs. 50 in spite of producing additional unit, this means that the additional unit must have cost him the same Rs. 50, so that the average is not disturbed.

This relationship can be expressed in the following diagram:



When the marginal cost is above average cost, the AC rises, that is the MC pulls the AC upwards. When the MC is below the AC, the AC falls. That is the marginal cost pulls down the AC, when MC stands equal to AC, the average cost remains the same. That is the MC pulls MC the horizontally.

The Laws of Returns

The laws of returns refer to the amount of extra output secured by adding to fixed input (or, factor) more and more of variable inputs (or, factors). To put it in simple language, if response is greater than the extra input, it is called Increasing Returns. If response is proportional to did extra input, it is called Constant returns. If response is less than the extra input, it is called Diminishing Returns. Of these three laws, the law of Diminishing Returns is the most important and is best explained in agriculture.

Law of Diminishing Returns

Among several law of production, the law of Diminishing Returns is the oldest and universal law. This law establishes a relationship between input and output and points out that with increasing input, output has a tendency to decline under certain circumstances. The classical economists associated the law of Diminishing Returns with agriculture as they thought that this law manifested in agriculture (Land) due to uncertainty of Nature and the response of Nature to human effort would not be proportionate. Dr. Marshall, though, improved the classical formation of the law, continued to attribute it to agriculture.

Marshall's Definition of the Law

Marshall defined the law of Diminishing Returns as follows "An increase in the capital and labour applied in the cultivation of land causes in

general less than proportionate increase in 'the amount of the produce raised, unless it happens to coincide with an improvement in the arts of agriculture".

Let us suppose a farmer having a plot of land measuring 10 acres is interested in increasing the output from his land by investing more and more of capital and labour. Let us assume that a unit of capital and labour is of the value of Rs. 100. Now we have to study how the inputs when increased as successive doses result in extra output. The land is kept as a fixed factor and the input (Labour and Capital) has been made a variable factor. The farmer, suppose, gets the following results shown in the schedule (Table 12.1).

From the table (12.1), we infer that the plot of land (10 acres) is combined with one unit of Capital and Labour worth Rs. 100, (input) and the output comes to 10 units of corn. By combining the same plot with 2 units of capital and labour, i.e., Rs. 200, the total output comes to 18 units. When 3 units of input are invested, the output becomes 24 units. Now we can distinguish three types of output from the table. They are:

(i) Total output or Total Returns;

(ii) Average output or Average Returns and

(iii) Marginal output or Marginal Returns.

Total Returns is the total output of corn for the total doses of capital and labour applied. Column 2 of the table gives total returns for the total inputs. The total return is increasing from 10 to 18, 24, 28, 30 units,

Table 12.1

Input - Output Schedule (Plot: 10 acres)

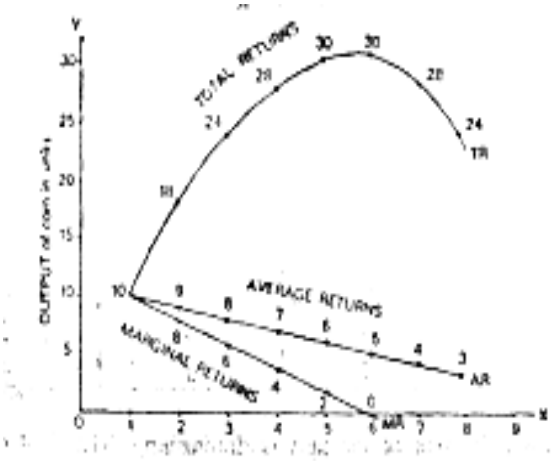
Labour and capital invested (input in units) (1)	Output of corn in units (Total output) (2)	Average output of corn in units (3)	Marginal output of corn in units (4)
1	10	10	10
2	18	9	8
3	24	8	6
4	28	7	4
5	30	6	2
6	30	5	0
7	28	4	-2
8	24	3	-4

etc. However, the rate of increase is diminishing. The total output is maximum when the input is 5 or 6 units. Average Returns refers to the output per unit of cap invested. This is arrived by dividing the total output with the total units of input. Column 3 of the table gives average output which decreasing.Margina1Returns refers to the output of corn due to increase in one unit of the input. IL refers to the extra output due to increase in input by one

unit- Column No. 4 the marginal output. When 1 unit is invested, the output 10 units; ‘when 2 units are invested the output is 18 units of corn. So, the extra 8 units of corn have been realized because of increasing the input from, 1 to 2 Units. The response for the second unit of input is 8 ‘units- of coin. This is marginal output for the second unit of it input. Similarly, when these are 3 units of input the total return stands at 24 units of corn. By increasing the input to 4 units, the total output has gone up to 28 units: the extra output is 4 units of corn due to the increase of one more unit of investment i.e., from 3 units to 4 units. So, the marginal output or returns at 4 units of input is 4 units of corn. The table shows that the marginal output goes on declining for every increase in input. This shows that the increase in input does not give output equally for successive doses. The first dose of input gives 10 units of corn. The second dose of input independently gives 8 units of corn. Similarly the third dose of input independently gives only 6 units of corn and so on. The marginal output goes on diminishing as the input is increased by unit doses. This is what is meant by the law of diminishing marginal returns. It will be always better to state this law as the Law of Diminishing Marginal Returns, as the marginal return diminishes with marginal inputs. After a stage, at sixth dose, the marginal return comes to zero. This means that the sixth does of input evokes no response at all.

The Data of the table can be expressed in the Figure 12.1

Figure 12.1



Input (Units of capital & labour)

In the figure X axis represents inputs in units of capital and labour. Y axis represents the output of corn in units. TR curve represents Total Returns; AR curve represents Average Returns and MR curve represents Marginal Returns. The three curves illustrate two basic facts, namely:

(a) Total output increase at a diminishing rate

(b) Average and Marginal outputs decrease.

According to the modern Economists, the law of Diminishing Marginal Returns works not only in agriculture and extractive occupations, but also fields of economic activity including manufacturing industries. The law will operate

in all fields where one or two factors of production are fixed while the others are variable, It was Edgeworth who first pointed out that the law has universal application not only to agriculture but also to industry. Benham defines diminishing returns thus: "As the proportion of one factor in a combination of factors is increased after a point, the marginal and average product of that factor will dminish." According to Prof. Samuelson "An increase in some inputs relative to the other comparatively fixed inputs will cause output to increase; but after a point, the extra output resulting from the same additions c" input will become less and less; this falling off of extra returns is a consequence the fact that the new 'doses' of the varying resources have less and Less f the constant resources to work with". Prof. Stigler defines as follows. "if the quantity of one productive service is increased by equal increments, the quantities of other productive services remaining fixed, the resulting increments of the product will decrease after a certain point".

There is nothing in these definitions suggesting that the law is applicable only to agriculture. In manufacture, capital is employed to the maximum extent. If we keep machinery fixed and increase raw materials, labour and organization, the output of commodities will not increase in the same proportion. This law is equally applicable to industries as well.

Assumptions of the Law of Diminishing Returns

The Law of Diminishing Returns will be operative only, on certain conditions and assumptions:

(i) The law is applicable only if one factor of production is kept constant or fixed. In our example, we have taken a plot measuring 10 acres as the fixed factor. More and more capital and labour are applied to the same plot. The additional doses should be applied in the same plot (intensively) and not on additional p1ots (extensively).

(ii) The factors of production utilized successively should be identical units. The law states that additional input used gives diminishing marginal output. This does not mean that additional inputs are inferior in quality or less efficient. All the units of input used are equally efficient. Hence, diminishing returns are not due to lower efficiency of capital and labour (input).

(iii) Another important assumption is that the technique of production remains constant throughout the application of additional doses. In our example, the art of cultivation is not changed when the inputs change. Adoption of new methods and improved techniques will definitely bring increasing returns and not decreasing returns. This does not mean that improved techniques will stop the operation of the law. The law will take more time to operate.

(iv) It should be understood that in earlier stages of cultivation, we may come across with increasing returns and not diminishing returns. This does not mean the law is invalid. Until the land is most efficiently used, there are possibilities of increasing returns. But after this point is reached, increasing returns will give place to Diminishing Returns. Under cultivation and insufficient capital employed are the cases where additional doses will lead to increasing returns. Hence, the assumption is made that the plot of land is most efficiently used.

Causes for Diminishing Returns

Why does the law of Diminishing Returns operate? The fertility of the land and the productive capacity of machinery are fixed. If additional inputs are used, the utilization of land and machinery reach their fullest capacity. Employment beyond this point overstrains the fixed factors (land and machines). This results in diminishing returns or increasing Costs per unit of output. We have assumed fixity of one factor of production. It is land in agriculture and machinery in industries. The fixity of supply of land sets the law in motion in the case of intensive cultivation. A limited supply of land or machinery cannot be expected to yield an unlimited output.

Secondly, even fixity of supply of one factor would not be a. problem if one of the variable factors were a perfect substitute. For, instance, in our example, land is kept fixed and capital variable. The law of diminishing returns could be held in check if labour or capital were a perfect substitute for land. The deficiency of land in that case could be made up by increasing the supply either of capital or of labour. But labour or capital is not a perfect substitute for land. The elasticity of substitution between land on the one hand and labour and capital an the other, is not infinite. Capital or labour may be substituted for land; but this substitution cannot be carried on indefinitely as they are not perfect substitutes. Initially the fixed factor land may be too much for variable factors, labour and capital. So it may lead to increasing returns. But as the variable inputs are increased, a point of optimum proportion between factors will be reached leading to maximum returns. Up to this point additional doses will result in increasing returns. But beyond this point additional doses will yield diminishing returns, as the combination of factors now progressively moves away from the point of optimum proportions.

Thirdly, even taking for granted that the productive capacity is increased indefinitely by making factors substitutable infinitely, the diminishing returns would set in ultimately as there is a limitation for organization and supervision. The work o supervision and organization after a point becomes so heavy, complicated and cumbersome that it is extremely difficult for a single man to manage. The diminishing returns would eventually set in. Hence the law of diminishing returns may well be called the infirmities of human nature or inability to substitute factors infinitely. According to Mrs. Joan Robinson, the law of diminishing returns operates due to imperfect substitutes.

The law of Diminishing Returns is applicable for all forms of production, agricultural or industrial. But the former is more subjected to the operation of the law because of the following reasons:

The law of Diminishing Returns is specially and quickly applicable to agriculture and other extractive occupation because of the supremacy of nature in these productions. Agriculture is more dependent on nature which is not so co-operative with production. Agriculture depends anon natural influence as rainfall, climate, weather, etc., which is unpredictable and not controlled by Man.

Secondly, the agricultural operations are spread over a large area and the agricultural season spreads over a number of months so' that effective supervision is difficult.

Thirdly, the gestation period or the time lag between the, input and output are very large in agricultural production. For instance, in food crops the time lag is from .3 months to one year. In the case of coffee and tea plantation the time lag spreads over 10 years. In the case of tamarind, jack, almond, will extend over l2 years. In casuarinas or lumbering the, time lag exceeds 20 years. When the time lag is very large, nature takes, upper hand and the control of man is completely lost.

Fourthly agricultural labour does not have work continuously and consequently productivity of agricultural labour is very low.

Lastly, the soil gets exhausted and fertility is lost. The scope for machinery, also limited. All these make the law manifest quickly in agriculture.

Modern Approach to the Laws of Returns

Law of Variable Proportions

The level of output of a firm depends on the combination of different factors, viz., land, labour, capital and organization. In order to bring about in change in the level of production, the quantities of the various factors engaged in production will have to be changed. An increase in production would be possibly bad only when either the quantity of all the factors is increased simultaneously, or when the quantity of some of the factors is increased while that of the others remains constant. Since all the factors are not easily available in the required quantities, it becomes necessary to keep the scarce factor constant and increase the quantity of other factors. Such factors whose quantities are given and fixed are called Fixed Factors, while those whose supply can be easily changed are called Variable Factors. Therefore to bring about an increase in the output, the producers would use more and more of the variable factor with the given quantity of the fixed factors. In the theory of production, the law which examines the relationship between one variable factor and output, keeping the quantities• of other factors fixed, is called the Law of variable proportions. Since under this law we study the effects on output of variations in factor proportions, this has come to be known as the law of variable proportions. This law has been variously defined by different economists.

"As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish."

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

It is obvious from these definitions that the law of variable proportions refers to the behaviour of output as the quantity of one factor is increased, keeping the quantity of other factors fixed and further it states that the marginal product and average product will eventually decline. From this we can understand that this law is only restatement of the law of diminishing returns studied already.

Assumptions of the Law of Variable Proportions

The law is based upon the following assumptions:

(i) The state of technology in production remains constant and unchanged. If there is any improvement in technology, the average and marginal output will not decrease but increase.

(ii) Only one factor of input is made variable and other factors are kept constant. This law does not apply in case all factors are proportionately varied. Behaviour of output as a result of the variations in all inputs is studied under "Returns to Scale".

(iii) it is possible to vary the proportions in which the various inputs are combined. This law does not apply to those cases where the factors must be used in rigidly fixed proportions to yield a product.

(iv) All units of the variable factor are homogeneous.

(v) Finally, it is also assumed that the entire operation is for short-run, as in the long-run all inputs can be variable.

Three Stages of the Law

The behaviour of the output when the varying quantity of one factor is combined with a fixed quantity of the other can be divided into three distinct stages. The three stages could be better understood by the Table 12.3.

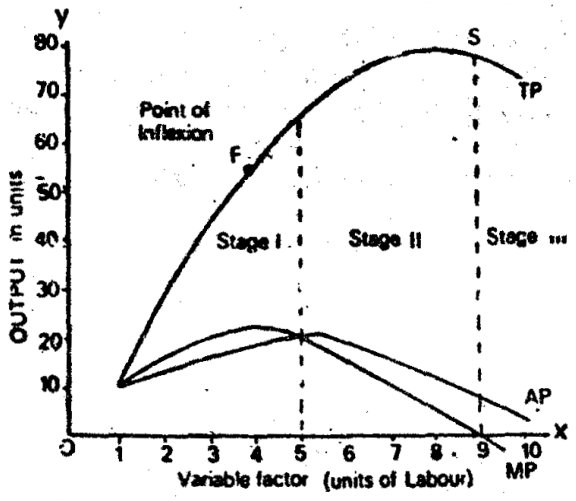
With data of the schedule, the law is illustrated by means of a figure-12.3 by taking the variable factor in the X axis and the output in the Y axis.

Stage I: In this stage, the total product increases at an increasing rate. The Total Product Curve (TP) increases sharply upto the point F. i.e., fourth combination where the marginal product (MP) is at the maximum.

Table 12.3

Fixed Factor (Machine) (1)	Variable Factor (Labour) (2)	Total Production in units (3)	Average Production in units (4)	Marginal Production in units (5)
1+	1	10	10.0	10
1+	2	22	11.0	12
1+	3	36	12.0	14
1+	4	52	13.0	16
1+.	5	66	132	14
1+	6	76	12:6	10
1+	7	80	11.4	4
1+	8	82	102	2
l+	9	82	9.1	0
1+	10	78	78	-4

Figure 12.3



Afterwards, i.e., beyond F, the total product curve increases at a diminishing rate, as the marginal product falls, but is positive. The point F where the total product stops increasing at an increasing rate and starts increasing at a diminishing rate is called the point of inflexion. At this point, the marginal product is at the maximum. So stage I refers to the increasing stage where the total product, the marginal product and average product are increasing. It is the Increasing Returns Stage.

Stage II: In the Second Stage, the total product continues to increase, but at the diminishing rate until it reaches the point S where it completely stops to increase any further. At this the Second Stage ends. In this stage, the marginal product and average products are declining but are positive. At the end of the second Stage, at point S, the total product is at the maximum and the marginal product is zero. It is cutting the x axis. The second Stage is the Stage of Diminishing Returns.

Stage III: In this Stage, the total Product declines and therefore the TP curve slopes downwards. The marginal product becomes negative cutting the X axis. This Stage is called the Negative Returns Stage.

Thus, the total product, Marginal product and average product pass through three phases viz., increasing, diminishing and negative returns stage. The law of variable proportions is nothing but the combination of the Law of Increasing and Diminishing Returns.

Now, the question is in which Stage the producer will seek to produce the commodities. Being rational, a producer will not come to the third Stage where the marginal product becomes negative; he will not produce to get negative. returns.' The producer' will also not' choose to produce in Stage I, as he will note making the best use of the fixed factory and he will not be utilizing fully the opportunities of increasing production by increasing quantity of the variable factor whose average product continues to rise throughout the Stage I. So, the rational producer will not stop in Stage I, but expand further. Stage I and III are stages of economic absurdity representing non economic region in production function. Hence the producer will produce in Stage II, where the total product leads to the maximum. At which particular point of the Second Stage the producer will decide to produce depends upon the prices of factors. The Stage II represents the range of rational production.

Difference between old and modern approach to laws of Returns

(i) In modern approach, there is one law having two phases, i.e., increasing and decreasing and the latter would manifest ultimately. But in classical approach there are different laws, viz., Increasing Returns and Diminishing Returns.

(ii) In classical example, land alone is a fixed factor. In modern analysis, any factor may be fixed and the others variable. The modern approach is decidedly superior to the old approach.

EQUILIBRIUM OF THE FIRM AND INDUSTRY

A consumer is said to be in equilibrium when he spends his limited income on different goods in such a way that he gets maximum satisfaction. Likewise, a producer is said to reach equilibrium when he combines the different factors of production so that he produces maximum output and at minimum cost. Similarly a firm while selling its finished product attempts to maximise its profit (or minimise its losses, in case losses are met with). A firm is said to be in equilibrium when it produces that output and fixes that price at which it secures maximum profit. We assume that

(i) The firm has only one aim or goal i.e., to get maximum possible profit.

(ii) The firm has full knowledge of the position where profit is maximum.

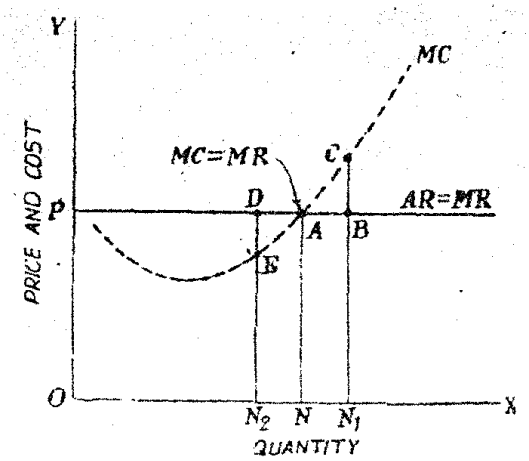
These two assumptions may not hold good in real life, for business firm may be satisfied with whatever profits they are securing. Besides, they may not

be in a position to change their output and their prices continuously and find out the position of maximum profit.

If a firm goes in for maximum profits it will not produce even in single unit of a product at a loss. For even when one unit is produced at a loss, the total profit will be reduced by the amount of the loss. To maximise profits a firm should produce and sell up to the point at which' the revenue from the last unit (marginal revenue) is equal to the cost of the last unit (marginal cost)., Beyond this point of equality of MR and MC the firm will experience losses, because additional cost will be more than the additional revenue received. Thus, the basic condition of a firm's equilibrium is that the firm should stop at the point of equality of marginal cost and marginal revenue (MC=MR).

Equilibrium of the Competitive Firm

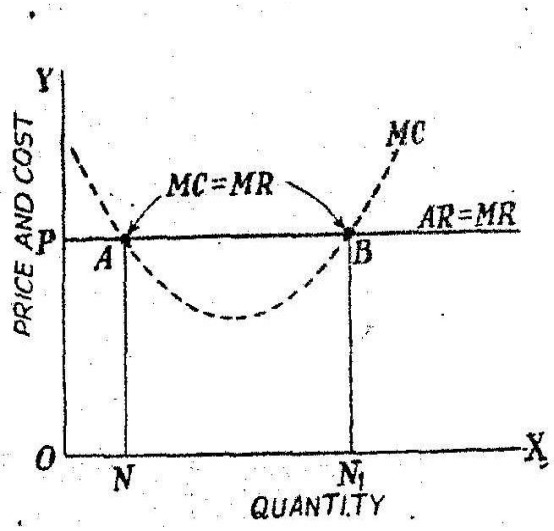
Fig. 1 illustrates the equilibrium of a competitive firm. The competitive firm has horizontal price line (since the firm is only a



price taker, and obviously, the average and marginal revenue coincide. The marginal cost curve is given as a dotted line. (The AC curve is not given as it is not required for our study of equilibrium). Point A shows the equality of MC and MR. ON is the equilibrium output. Output beyond this say, at ON_1 will mean losses to the firm. For any output beyond ON, marginal cost exceeds marginal revenue. Therefore, if the firm produces ON_1 output, it will incur a loss indicated by the triangle ABC. The firm will not, therefore, produce and sell any quantity beyond ON. On the other hand, the competitive firm can produce a smaller quantity, say ON_2. In this case, the marginal revenue is higher than marginal cost and this is to the advantage of the firm. But the firm can increase its total profit by producing the additional output N_2N. By doing so, additional profit worth DEA can also be secured by the firm. Since the firm wants to have maximum profit, it will not stop its production at ON. The best output or equilibrium output, therefore, is the one indicated by the equality of MR and MC (ON output).

The first condition of equilibrium of a firm, therefore, is the equality of MC and MR.

Fig. 2.



The equality of MC and MR is a necessary condition but not an adequate condition for equilibrium. We require a subsidiary condition, i.e., the marginal cost curve should cut the marginal revenue curve from below. In other words, after the point of equilibrium, MC must exceed MR. In Fig. 2, the MC curve cuts 'the MR in two places, viz., at' point A from above and at point B from below. This is often referred to Fig. 2, as multiple equilibrium. However, point A cannot be a determinate equilibrium point, since beyond this point the marginal cost is, lower than marginal revenue and it is to the advantage of the firm if it produces more. By doing so, the firm can secure profits enclosed by the area between A and B. If the firms is assumed to go for maximum profit, then there is no reason why the firm should stop at ON, 'even though marginal cost is equa1 to marginal revenue at that point. The determinate equilibrium point is in fact ON1 for beyond that point, marginal cost is higher then marginal revenue. We can state the two conditions of equilibrium as:

a) MC and MR should be equal, and
b) The MC curve should cut MR curve from below

Specific conditions.

Apart from these two general conditions of equilibrium (applicable to all firms and to all points) both short and long runs there are some specific conditions of equilibrium also. For instance in the short period, the price must at least be equal to average variable cost (i.e., AVC); if the price is less than AVC, the firm will have to close down. If the short period is to or more than AVC, the firm will decide to produce. When the firm decides to produce positions of equilibrium is the equality of MC and MR. In the long period, the firm will be in equilibrium when the price covers or is equal to average cost. The long period price cannot he lower than long run AC; that case the firm would incur losses in the long run and this is not possible. Hence the minimum acceptable price for the firm in the long run is the one equal to AC. When this condition is fulfilled, the firm will produce; only after these specific conditions

are fulfilled then the general conditions of equilibrium will have to he fulfilled, viz, MC must he equal to MR and after the point of equilibrium MC must exceed MR.

Equilibrium of the Monopoly Firm

Fig .3

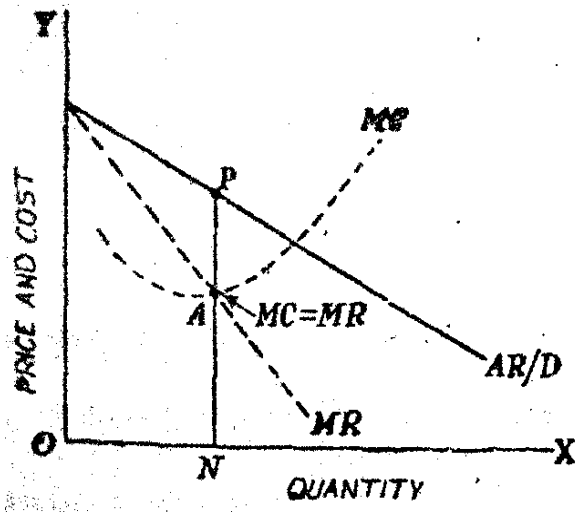


Fig. 3 illustrates the equilibrium of a monopoly firm or a firm under imperfect competition. In Fig. 3, the monopoly firm has a down ward sloping demand curve which is also the AR curve. The corresponding MR curve is at lower level, The MC curve is rising. At point A, the MC curve cuts MR curve from below. This is the equilibrium position of the firm. The equilibrium quantity is ON and the equilibrium price is NP. The firm cannot produce beyond ON because the additional cost of production (MC) will be higher than the additional revenue (MR). At the same time the firm will not like to produce less than ON because its profit will not be maximised. Therefore, the monopoly firm is in equilibrium where MC=MR. You may note further that the, MC - curve cuts MR curve from below. This position will not be different even when we take, horizontal marginal cost curves or falling-marginal.

2. Equilibrium of the industry

Now that you have an idea of the equilibrium of a firm, you should have a general idea of the equilibrium of the industry. In economics, an industry consists of all firms producing an identical product. When is an industry in equilibrium? An industry is said to be in equilibrium when the supply of the product is equal to the demand for the same. It is possible that demand and supply may be equal in a short period of time but the industry may be attracting new firms to enter or may induce the existing firms to leave it. This may happen when the short period price is so high that firms get profit and consequently new firms are attracted to enter the industry; or the short period equilibrium price yields a loss to individual firms and consequently induces existing firms to leave the industry. In the short period, therefore, a competitive industry is in temporary equilibrium since

(a)demand and supply are equal ; but

(b) firms are getting in or getting out and are thus disturbing the supply of the industry.

Over a long period, however,, all possible adjustments would have taken place. No new firm would be getting in and no existing firm would be getting out. The long-period equilibrium of a competitive industry would be a permanent one, in the sense that

(a) industry's demand and supply would be equal, and

(b) firms would not be leaving the industry nor would new ones getting in

PRICING UNDER PERFECT COMPETITION

Features and Implications of Perfect Competition

A market for a product is said to be perfectly competitive when the following features are present:

(i) Large number of buyers and sellers. In a perfectly competitive market there should be a large number of buyers and sellers. This condition is very essential, even though it is very difficult to define the concept "large," when there are millions of buyers and sellers each contributing a insignificant portion to the total volume of goods bought and sold, it is difficult for any one producer or buyer to affect the price. Thus the large number of buyers and sellers assumed to exist in a perfectly competitive market explain the lack of control by individual buyers or sellers over price.

(ii) Homogeneous product. The product offered for the sale by all the sellers must be homogeneous. The buyers regard the product of all the sellers as identical and have no preference for dealing with any particular seller. The goods offered for sale are perfect substitutes for one another from the buyers point of view and the elasticity of substitution is infinite. From this condition of homogeneity of the product, if a seller raises his price even slightly above the current level, he will lose all his customers to the other sellers. Nor will he lower his price from the ruling price, since he can sell all his output at the prevailing price.

(iii) Freedom to move in or move out. Perfect competition implies that firms have freedom to enter or leave the industry. Each firm is small in size, and produces only a small portion of the total output. Hence, one or two firms, entering the industry or leaving it, will not affect the size of the industry or the price of the product in the market. New firms will be attracted to an industry if prices are high and supernormal profits are earned; and some of the existing firms might leave the industry if prices are low and losses are incurred. There is also freedom for consumers to enter or leave the market. Low prices will attract consumers to enter the market, but high prices will induce them to leave it.

Freedom to move into an industry also implies the absence of natural or artificial restrictions which the existing firm or firms may exercise over new comers.

(iv) Full and unrestricted competition. Competition implies rivalry in buying and selling a commodity. Buyers compete among themselves to buy the

commodity. They should not be able to combine or co-operate. If they combine, they can reduce the price. But in a perfectly competitive market, there are so many buyers that it is difficult for them to join together. Sellers too compete among themselves to sell their stock of goods. If a group of sellers join together, they can raise the price of their product, but whenever the market is perfectly competitive there is no possibility of combination or co-operation among buyers or sellers. Thus, in a perfectly competitive market, competition among buyers and sellers is perfect and unrestricted.

(v) Perfect knowledge. Perfect competition implies perfect knowledge on the part of buyers and sellers regarding market conditions. It is assumed that the buyers know the nature of the product as well as the price at which it is sold. No buyer will be prepared to pay a price higher than the ruling price. The seller must have perfect knowledge of potential sales at various price levels and also perfect knowledge of cost behaviour. Factory owners and business firms should have complete information regarding alternative employment possibilities of resources and also of profit margins in different industries. Imperfect knowledge leads to wrong resource allocation and income distribution. Too many producers; may enter a particular industry and may make unwarranted expansion of plants, etc. Perfect knowledge is essential to maximise profits. Since we assume knowledge to exist on the part of buyers it follows logically that under perfect competition, advertisement and sales campaigns have no place and consequently selling costs are ruled out in a perfectly competitive market.

(vi) perfect mobility of factors of production. Perfect knowledge, it should be pointed out here, is one of the two perfections necessary for perfect competition. The other perfection referred to is free and complete mobility of fectors of production from one use to another. Imperfection in mobility may be the result of restricted entry of new firms into an industry either due to natural conditions such as limited raw material supplies or to artificial factors such as patents, trade marks and other legal restrictions. Imperfection in the movement of factors may also be due to the non-adaptability of resources particularly capital goods and certain types of specialized labour – that is, they may be useful for one industry but may not be useful for others. Under conditions of perfect competition capital and labour have perfect mobility, i.e., they move from industries which offer less remuneration to those with higher remuneration. This criterion of perfect competition will remove any possible tendency of some firms or a group of firms to get monopoly power over the supply of factors and ultimately over the supply of the product.

(vii) absence of transport costs. Under perfect competition, we assume that transport costs do not exist. This assumption is essential so that there may be uniform price throughout the market. If transport costs are present, prices must differ in different sectors of the market.

Price Determination under Perfect Competition

In perfect competition, there are a larger number of buyers and sellers and we have seen that the actions of individual buyers and sellers cannot

influence the market price. The prevailing price of the product in the market is taken for granted. The buyer has to make the outlay guided by the price. Similarly the supplier has to make the supply guided by the price. But how the price in the market has been arrived at? Price under perfect competition is determined by the interaction of two forces, viz., demand and supply. Though individuals cannot change the price, the aggregate force of demand and supply can change the price. The demand side is governed by the law of demand based on marginal utility of the commodity to the buyers. The supply side is governed by the cost of production. The law of supply operates. The interaction of demand and supply determines the price of the commodity. To be very precise, the interaction of marginal supply and marginal demand decide the price.

Equilibrium Price

The price determined by the interaction of demand and supply is called the equilibrium price. We know that the demand curve of the market will slope downwards from left to right indicating that buyers will demand larger quantities at a lower price. We know that the supply curve in an industry normally slopes upwards from left to right indicating that more supplies will be forthcoming at higher prices. The level at which the demand curve intersects the supply curve determines the equilibrium price. The price which will come to prevail in the market is one at which quantity demanded is equal to quantity supplied. Equilibrium price is that price at which quantity demanded is equal to the quantity of the product supplied. At this price the two forces, viz., demand and supply balance each other and the balanced quantity. at this price is called equilibrium amount.

Only at the equilibrium price, the buyers as well as sellers are satisfied. If the price is different from the equilibrium price, the buyers and sellers wishes will be inconsistent. Either buyer would demand more or the sellers would supply more.

Suppose the price is greater, than the equilibrium price the quantity supplied would exceed the quantity demanded. Consequently some of the sellers would be able to sell the commodity. So, they would try to dispose the unsold stock at a lower price. Thus the price will go on declining till the quantity demanded equals the quantity supplied.

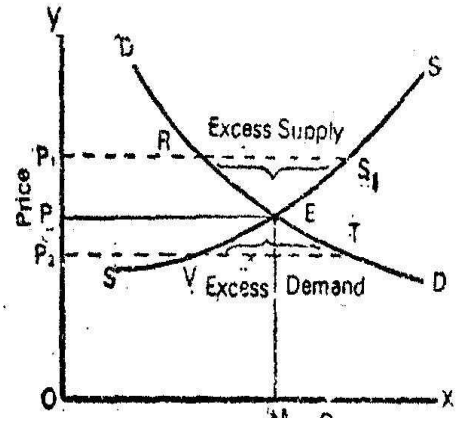
On the other hand if the price is below the equilibrium price, the quantity demanded would exceed the quantity supplied. So, some buyers would not be able to obtain the commodity. They would therefore bid the prices up in their effort to get their desired quantity. Thus the price would go on rising till the quantity demanded and quantity supplied become equal.

Lastly, it is equilibrium price which will settle down making demand and supply equal.

This can be illustrated by a figure showing the demand and supply curves. The demand schedule of the market is the summation of the individual demand. The supply schedule gives the quantity supplied by different firm. With the help of the demand and supply schedules, we can draw the market

demand curve and the market supply curve. The intersection of the two curves show the equilibrium points as depicted in Figure 18-1

Figure 18.L



Quantity

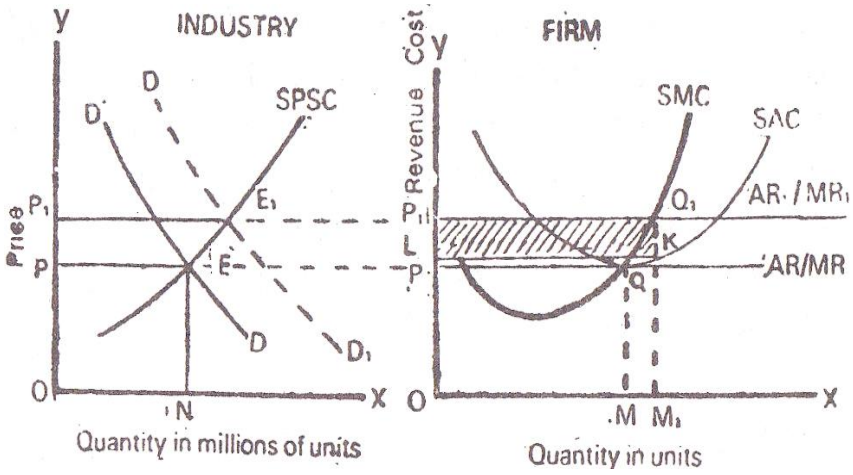
DD is the demand curve sloping downward. SS is the supply curve sloping upward. They intersect at E, the equilibrium point. The corresponding price is OP and the amount is OM. OP is the equilibrium price and OM is the equilibrium amount. At the price OP the industry is prepared to supply OM amount and at that price the market is prepared to take OM. The market is cleared at this price and there is no shortage of supply nor unsold stock. Suppose the price increases above the equilibrium price. At the increased price OP_1 the demand is only P_1R while the supply is P_1 S_1. The excess supply is RS_1 which the buyers will not take oft the market at price OP_1. In order to dispose off this excess, sellers will compete and bring down the price to OP. Similarly, if prices fall to P_2 there is an excess demand VT and the price will be pushed up and ultimately the equilibrium price will prevail in the market.

Equilibrium of Industry and Firm in the Short Period

(Determination of Short Period Price)

Short period price of the industry is determined by finding out short run equilibrium between demand and supply. Supply curve in the short run under perfect competition is a lateral summation of the short run marginal cost curve of the firm. The short run supply curve of the industry will slope upwards from left to right. We can find out the short period demand which will be the summation of individual demand. With short run demand and supply curves of the industry we can find out the equilibrium price for the commodity. This price, determined on the interaction of short period demand and supply of the industry is passed on to the firms to sell their goods at that price. The interaction of demand and supply in the industry determines the price and the firms have to take the price for granted and determine their output on the basis of the market price and their cost conditions. The Figure 18-4 shows how the short run price is determined under perfect competition i.e., how the price determined by the industry is taken up by the firms of output adjustments.

Fig Sank 18-4



The figure on the left shows the position of the industry. DD is the demand curve. SPSC is the short period supply curve. The market comes to short period Equilibrium at E and the market price is determined at OP for which ON millions of the commodity are supplied and demanded. This price Op is passed on the the firms to determine their output policies. This OP becomes the AR curve for the firm and as we have studied already, this AR is a straight line parallel to X axis and MR lies in the same line. X axis on the left side (industry) denotes commodities in millions of units whereas on the right side (firm) it denotes only units. With the given price OP, we have drawn the SMC, the short period marginal cost and short period average cost (SAC). The firm comes to equilibrium at Q where MR=MC and MC cuts MR from bellow. OM is the equilibrium output. The firm earns only normal profit as AR curve is tangential to AC curves.

To study the process still further, let us imagine that the demand in the industry goes up and consequently the demand curve shifts to DD_1. It cuts the short period supply curve at E_1. Here we have to understand that though it is a short period one, the industry can expand the supplies by gearing up the available capital equipment to meet the increase in demand. Consequent on the increase in demand, the new equilibrium price has gone up to OP_1 which is passed on to the firms. Now this price OP_1 becomes the average revenue and marginal revenue of the firm. AR_1 and MR_1 in the figure of the firm. This increase in price has benefited the firm as it can now increase its output and come to equilibrium at Q_1 and the output has increased to OM_1. At this equilibrium level the firm is earning super-normal profit shown by the rectangle P_1Q_1KL. The rise in price enables the firm to earn extra profits. Hence the industry is not in equilibrium. It is also possible that the price may go down and find anew level consequent on he demand going down. In that case the new equilibrium price will be extended to the firm and the firm may incur loss instead of profit. The firm will minimize the loss by reducing the

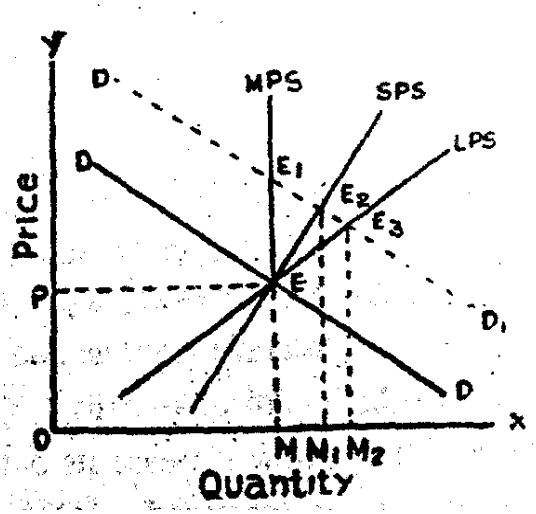
output and keeping it at equilibrium level. During the short period in both ways, the industry is not in equilibrium as there will be tendencies of entry of new firms when there is extra profit situation and in the case of loss, the tendencies will be for the exit. But in the short period these are not possible. Only in the long run, the movement will result in the change of supply conditions and the industry will come to equilibrium in which all firms will be earning just the normal profit on the basis of the equilibrium price of the industry determined on the interaction of long period demand and long period supply.

EQUILIBRIUM OF THE INDUSTRY IN THE LONG PERIOD

(Determination of Long Period Price — Normal Price)

The long period normal price is the result of long period normal demand and supply of the industry. In the long period, the supply of the industry will be adjusted, and the adjustment will become complete. The capital equipment will be changed to alter productions; new firms will enter and establish themselves. The demand which had been changing frequently would come to normalcy. When all adjustments are complete, equilibrium market price will be equal to long run equilibrium. This means that the long run equilibrium price will be the short run equilibrium price and the same price is the market price or very short period price. The figure 18-5 indicates how the long period equilibrium is achieved by the adjustment of supply during the course of market period, short period and long period.

Figure 18-5



DD : Demand Curve

DD_1 : Demand Curve

LPS : Long period Supply curve

SPS : Short period Supply curve

MPS : Market period Supply curve
i.e.; very short period
(supply fixed)

OM : Equilibrium quantity.

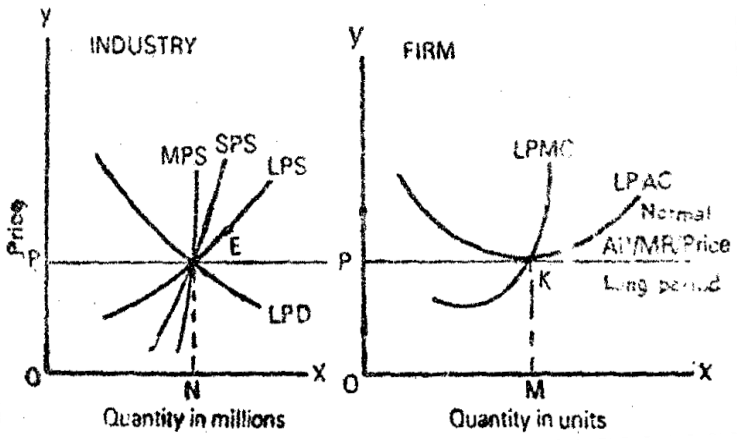
OP : Equilibrium price

E : Equilibrium point,

If there is an increase in demand, the market equilibrium price (very Short period) will shift up wards to E_1. In the short period it will find itself at B2 and in the long run the equilibrium position will be at B3. A higher demand curve will therefore push up the price as well as the quantity lifted from the market.

The long period normal price of the industry will be passed on to the firms who have adjusted their cost conditions in such a way that their average revenue is equal to average cost and the long period AR and MR curves (normal price) will be tangential to the bag period average cost curve; the point of tangency will be at the minimum and the firm will be in equilibrium earning just normal profit. The Figure 18-6 indicates long period condition of the firm in relation to industry. In the long period, price = Marginal cost. MR = MC; MR = Price. So price = MC.

FIGURE 18 – 6



Long period Equilibrium price i.e., Normal price:

OP = Price

ON = Quantity in millions

LPS = Long period supply

LPD = Long period demand

LPMC = Long period Marginal Cost

LPAC = Long period Average Cost

OM = Quantity in units.

PRICING UNDER MONOPOLY

1. Meaning of Monopoly

Monopoly is a market structure in which there is a single firm producing all the output in a particular market and there are significant barriers to entry. The monopoly firm produces an industry's entire output.

2. Characteristics

The major characteristics of monopoly market structures are:

(i) A single firm

The monopolist is the only producer of the good. Sometimes, monopoly is geographically defined, for example, Delhi gets electricity from NDPL, water supply from MCD. That is, there is one supplier of service in a specific geographic region.

(ii) No close substitutes

There are no close substitutes for the commodity produced by the monopolist. The monopolist produces all the output in a particular market. He is a price-maker.

(iii) Barriers to entry

There are significant barriers to entry of new firms. In other words, entry is blocked.

(iv) Goal is profit maximization

The monopolist has single goal of profit maximization. The goal is achieved by producing that level of output where MR=MC

(v) Perfect knowledge

Monopolist is assumed to be having perfect knowledge about market conditions. Hence, uncertainity about developments in the market is ruled out. Information is obtained by incurring expenses according to the marginal rule, MR=MC.

3. Types of Monopoly

There are two types of monopoly:

1. **Simple monopoly:** this is a market structure where the monopolist charges a uniform price from all consumers of the commodity. It is also called pure monopoly.
2. **Discriminating monopoly:** This is a market structure where the monopolist charges different prices from different consumers or charges different prices on different units sold to the same consumer.

4.Factors Emerging Monopoly

(i) Control of a Strategic Raw Material. It may be possible for a single firm to acquire control of all or most of the supply of a strategic raw material required for a particular business. The monopoly firm may be facilitated by nature if these resources are localized and are found in one religion. It is usual to cite the example diamond industry in South Africa. Most

diamond mines are located within a comparatively small area in South Africa and it was easy for the De Beers to get possession of these diamond mines and affect a monopoly of the worlds diamond supply. In this case, the monoploy firm has been able to exclude all its competitors at will. Such a monopoly s m times referred to as natural monopoly.

(ii) Public Utilities. Public interest may be a very important factor in the emergence of monopolies, known as public utilities.

In the case of electric power, telephones, railway transportation, etc., there is very heavy investment; besides, supply by more than one company will result in enormous economic waste, inconvenience and high Cost to consumers. If rival firms are engaged in supplying electricity or providing water to a city, there would be duplication of investment in the form of a network of cables, pipes, etc. all this would be a waste. It is in the social interest that there should be a single company undertaking these services in a city or region. Hence these are known as social monopolies. The government normally grants special charter or franchise to such monopolies, prohibiting the entry of new companies.

(iii) Fiscal Monopolies. There are certain monopolies operated by the State itself. The most common examples are the post office, the minting of coins and printing of currency notes, etc. These are services which are essential and which private companies may not be able to undertake or which cannot be entrusted to private parties (as in the case of coinage), However, in some countries, the government has taken control over certain goods mainly from the point of view of earning profit. Examples are government monopoly of salt and tobacco in France, and, production and distribution of petrol in India. These monopolies are known as fiscal monopolies and the number of these monopolies are increasing in recent years.

(iv) Legal Backing by the Government. Monopolies may arise and may continue to exist as a result of legal banking and hence may be called lega1 monopolies. Under patent and trade mark laws, every government grants patents, trade marks, copyrights, etc., to inventors of new articles, new processes and new devices. A firm which acquires patent rights for the production of a particular commodity gets an absolute monopoly in its production, by excluding all other producers. It is also protected by law against imitation by rival producers. Two special features of legal monopolies should be noted. First, patent rights, trade marks, etc, are not given to the holders permanently but only for a fixed period of years. Second, patent rights and trade marks may not create absolute monopolies but tend to create monopoly power.

(v) Restricted Market for a Product. Sometimes, a firm assumes monopoly power when the entire market for a commodity can be comfortably served by only one firm and not more than one. In the beginning there might have been two or more firms in the industry. Because of the inability of the market to accommodate more than one firm, all but the largest and the most efficient will have to leave the industry. It may be mentioned here that the

presence of large-scale economies in certain lines of production will result in mass production and this may lead to the emergence of a single firm as a monopoly power. Either the optimum firm is so large or the market is so small that there can be only one firm under the circumstances.

(vi) Control of a Secret Process. A monopoly may arise simply because of the control of a self process by a single company. An important product may be manufactured through a process known only to one firm or only to an individual. The lucky owner will be able to reap a fortune but then such monopolies cannot be numerous.

Determination of Simple Monopoly Price

We shall explain price determination under simple private monopoly which has absolute power to follow whatever price and output policy it desires. Obviously, such a monopoly may be assumed to have only one aim, viz., profit maximisation. The condition of profit maximisation or equilibrium condition is the equality of MC and MR. The monopoly firm produces that output and fixes that price at which MC is equal to MR. To explain price and output determination under monopoly, it is necessary to analyse the revenue and cost curves of the firm.

Revenue and cost curves

Since the monopoly firm, is also the monopoly industry, the demand curve for the product of the monopoly firm is also the demand curve of the industry. This demand curve will be sloping downward to indicate that the monopolist can sell more of his product only by reducing its price. It is true that the monopoly firm has complete control over the supply of the product but this does not mean that the firm can, sell any quantity at any price. As has been explained already, the demand curve is also the AR curve for the firm. As the demand curve is sloping downward, the corresponding MR curve is also sloping downward but at a faster rate ; and the MR curve will be at a lower level while the AR curve will be at a higher level.

The cost curves of the monopoly firm do not differ materially from those of a competitive firm. The costs of production are determined by the law of returns which is a physical law and which, therefore, applies to all types of firms. The monopoly firm will have AC and MC in the short period, and the short-period AC will consist of AFC and AVC. In the long run, the monopoly firm will have AC and MC of production.

Price and Output Determination in the Short Period

Fig . 1

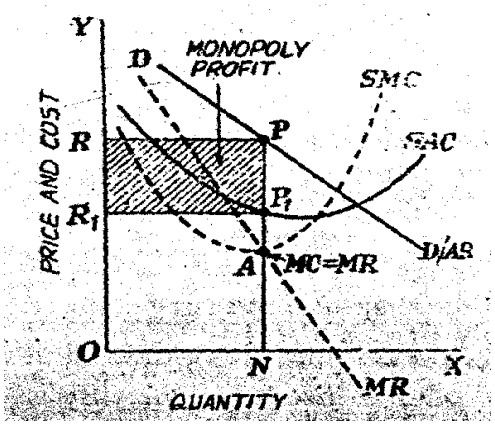


Fig. 1 illustrates the price and output determination under simple monopoly during the short period. In the figure, both revenue and the cost curves are given. For the sake of simplicity, we have given short period AC curve and have omitted AFC and AVC curves; as the monopoly price tends to be higher than AC, it is not necessary to have AFC and AVC. The equality of marginal cost and marginal revenue at point A indicates the equilibrium of the firm. A perpendicular parallel to the Y-axis is drawn at point A connecting the X-axis at N and the demand curve at P. NP is the equilibrium price and ON is equilibrium output. In Fig. 1 note that

$$\begin{aligned}\text{Profit per unit} &= \text{Average Revenue - Average cost}\\ &= PN - P_1N\\ &= PP_1\\ \text{Total profit} &= PP_1n \times ON \text{ (i.e., No. of units produced)}\\ &= PP_1R_1R\end{aligned}$$

The total monopoly profit is the shaded area PP1 R1R which is the largest amount of profit the firm can secure. At any other price and quantity, total profit will be less.

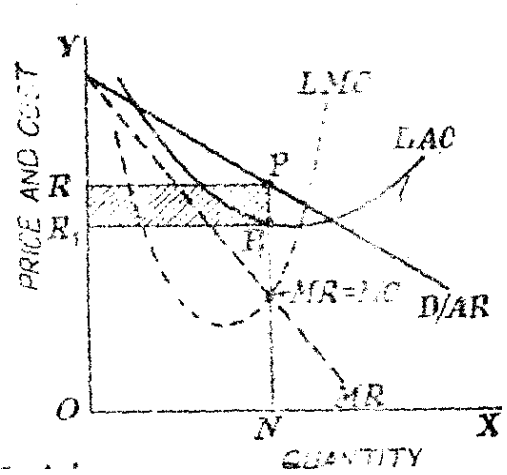
It is not strictly necessary that the monopolist should get excess profit even in the short period. It is quite possible for the short-run monopoly price to be lower than the SAC but the monopolist will continue to produce as long as his AVC is covered. The only difference between a competitive firm and a monopoly firm during the short period is that there is a greater tendency for the monopolist to get a price higher than AC and secure excess profit.

Price and Output Determination in the Long Period

The monopoly price determination in the long run is similar to that under the short period. In the long run the monopoly firm adjusts its capacity to changes in the long-run demand. After these adjustments are complete, the monopoly firm will have a long period equilibrium, determined by the equality of long-period marginal cost and marginal revenue as shown diagrammatically

in Fig. 2. This figure is not different from the previous figure. In Fig. 2, the monopoly firms a price PN in the long run. The total profit will he equal to the shaded area PP1 RR.

Fig . 2



It may he noted that there is always tendency for the monopoly firm to secure excess profits, even in the long run. Since entry into the industry is prohibited.

PRICING UNDER MONOPOLISTIC COMPETITION:

Assumptions and Features of Monopolistic Competition

Monopolistic Competition, as the name itself implies, is a combination of monopoly and competition. It refers to the market situation in which many producers produce goods which are close substitutes of one another. But there will be some product differentiation to identify it with the firm, and that particular brand of product will have a group of loyal consumers. In this respect, each firm will have some monopoly and at the same time the firm has to compete in the market with the other firms as they produce a fair substitute. The essential feature of monopolistic competition is product differentiation and existence of many firms supplying the market. Let us discus some of the features of monopolistic competition.

(i) Existence of Large Number of Firms: Under monopolistic competition, the number of firms producing a commodity will be very large. The term very large denotes that the contribution of each firm towards the total demand of the product is small. There are no possibilities of firms acting in collusion because of the large number and smaller output. Each will be acting independently on the, basis of product differentiation and each firm determines its price-output policies. Under these conditions the firms are bound to be small sized. Examples of monopolistic competition may be found in many retail traders, grocery stores, service industries like petrol stations, shoe repairing and dry cleaning establishments. Any action of the individual firm in increasing or decreasing the output will have little or no effect on other firms.

ii) Product Differentiation: Product differentiation is the essence of monopolistic competition It is a technical term for a familiar fact. Many

popularize their products stressing on the special features of their customers are made to feel that there are differences. In the production, of soaps, cosmetics, etc, different firms producing the same commodity differentiate their product. For instance many firms produce toilet soap. My toilet soap is a substitute for the toilet soap produced by different firms. But by popularizing a particular brand with specific aroma, size, shape, colour, the firm captures a portion of the market and the consumers will become used only to that brand. In this way the producer exhibits monopolistic power over his loyal customers. Greater the product differentiation, greater will be the element of monopoly for the firm. So also the case with toothpaste marketed by different brand names, such as Colgate, Cibaca, Forhans, Signal, Kolynas, etc. The producer of 'Colgate' has a monopoly of producing his product 'Colgate' and no other producer can bring out toothpaste under the name 'Colgate'. But the producer of Colgate faces competition from other firms producing toothpaste under different names, as, after all the commodity is a close substitute.

Product differentiation can be brought about in various ways. It may be by using different quality of the raw material and different chemicals and mixtures used in the product. Difference in workmanship, durability and strength will also make product differentiation. Product differentiation may also be effected by offering customers some benefits with the sale of the product. Facilities like free servicing, home delivery, acceptance of returned goods, etc., would make the consumers demand that particular brand of product when such facilities arc available. Product differentiation through effective advertising is another method. This is known as Sales Promotion. By frequently advertising the brand of the product through press, film, radio and TV, the consumers are made to feet that the brand produced by the firm in question is superior to that of other brands sold by other firms. Thus, product differentiation is attempted through (a) physical difference, (b) quality difference, (c) imaginary difference and, (d) purchase benefit difference. The ultimate aim of product differentiation is to capture a large number of customers to the firm's product and advance monopolistic interest in the midst of a large number of firms competing. Hence monopolistic competition is sometimes called the case of differentiation and large numbers.

(iii) Selling Costs: From the discussion of product differentiation, we can infer that the producer under monopolistic competition has to incur expenses to popularize his brand. This expenditure involved in selling the product is called selling cost Most important form Of selling cost is advertisement cost. Sales promotion by advertisement is called non price competition.

(iv) Freedom of entry and exist of firms: Another important feature is the freedom of any firm to enter into the field and produce the commodity under its own brand name and any firm can go out of the field if so chosen. There are no barriers as in the case of monopoly.

Monopolistic competition presupposes that customers have definite preferences for particular varieties or brand of products. Hence pricing is not

the problem but product differentiation is the problem and competition is not on prices but on products.

Thus, in monopolistic competition, the features of monopoly and perfect competition are partially present.

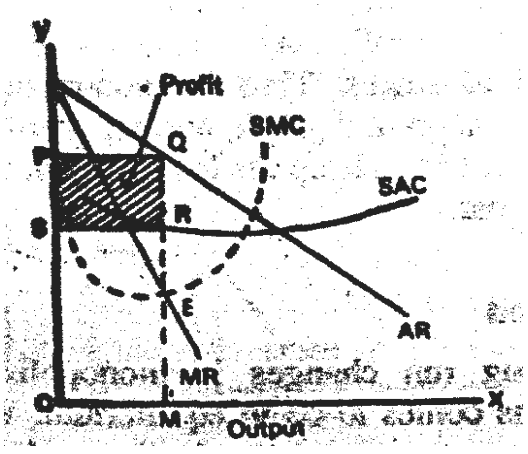
Price Determination

Price.-output determination under monopolistic competition is governed by the cost and revenue curves of the firm. The cost curves are governed by laws of production. The revenue curves of the firm will not be very elastic, as to be a parallel to X axis, as in perfect competition. It will not be very steep falling curves as in monopoly. The Average revenue curve of the firm under monopolistic competition will be a sloping down curve, the slope being neither too steep nor too flat. It will not be flat or parallel straight line because the firm may not have very elastic demand for its product. The product is not homogeneous but, slightly different from that of other firms. The firm cannot sell unlimited quantities at the established price as the products of other firms are close substitutes, if not perfect substitutes. The curve will not be too steep because, the demand under monopolistic competition will be much more sensitive to small changes in price as any fall in price could ensure more customers using the substitute product of other firms. Similarly, any rise in price will drive out many customers from the firm to go demanding other firm's product. Thus, under monopolistic competition, the AR curve will be a fairly sloping down curve and MR curve will lie below it.

Equilibrium of the individual firm

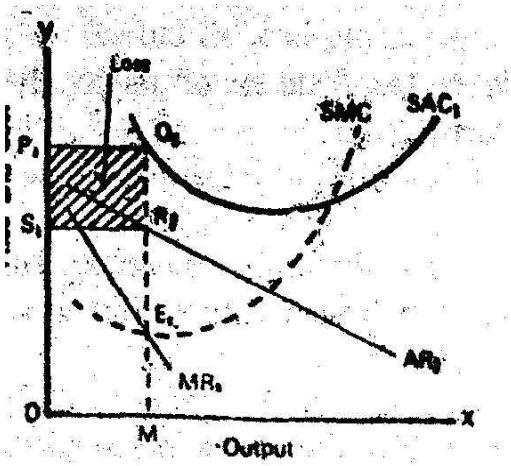
The monopolistic competitive firm will come to equilibrium on the same principle of equalising MR to MC. Each firm will choose that price and Output where it will be maximising its profit. The figure 20.1 shows the equilibrium of the individual firm in the Short period.

Fig 20.1



The short period marginal cost and average cost curves are shown as SMC and SAC. The sloping down average revenue and marginal revenue carves are shown as AR and MR. The equilibrium point is E where MR=MC. The equilibrium output 0M and the price of the product is fixed at OP.

Fig 20.2



The difference between average cost and average revenue is RQ. The output is OM. So, the super normal profit for the firm is shown by the rectangle PQRS. The firm by producing OM units of its commodity and selling it at a price of OP per unit realizes the maximum profit in the shod run. Finns may incur losses also. This is shown in figure 20.2.

With the revenue curves and cost curves the firm comes to. equilibrium at E_1 where MR = MC. At this point the firm is making the minimum loss P_1 Q_1 R_1 S_1. Shown by the shaded rectangle. The price is P_1. The firm incurs loss in the short run because average cost is higher than average revenue.

The different firms in monopolistic competition may be making either abnormal profits or losses in the short period depending on their costs and revenue curves. The price of the commodity of the different firms will be different because the firms adopt individual price policy. Based on consumer-preference of the product of the firm, and the cost of production, each firm will be fixing its price which may be different from the price of other firms. Old and long-standing firms with established customers and goodwill find high price advantageous The technique of production due to long experience may also result in very comfortable cost position. So established firms will be making abnormal profits in the short period. Newly started firms may have to fix the price at a lower possible level to establish themselves. The profit may not be very high. It may even result in loss at the Initial stages. Thus in monopolistic competition firms may be making either abnormal profit, normal profit or loss in the short period. Finns making losses will keep the loss at minimum and try to cover the average variable cost.

Group Equilibrium in the long period

Now we have to discuss the long nun changes in monopolistic competition where the Group firms come to be in equilibrium. We have to explain how price-output adjustments are made by the firms whose products are close substitutes. We have already explained that the different firms in the group adopt independent price-output policies because of their monopolistic position with reference to the peculiarity of the product. But we should bear in

mind that the product is a close substitute of other firms. In the short run when firms make huge profit, the tendency will be for the new producers to enter the field. But the difficulty of finding out the group equilibrium arises Out of diversity of conditions of various firms constituting the group. Each firm in its own way caters the specific tastes and preferences of the group of consumers. So, each firm will have different demand curves and cost curves depending on their efficiency.

Chamberlin solved the difficulty by making some 'heroic' assumptions of uniformity to arrive at long run equilibrium of the group.

(i) The firms competing in the group are producing more or less similar products;

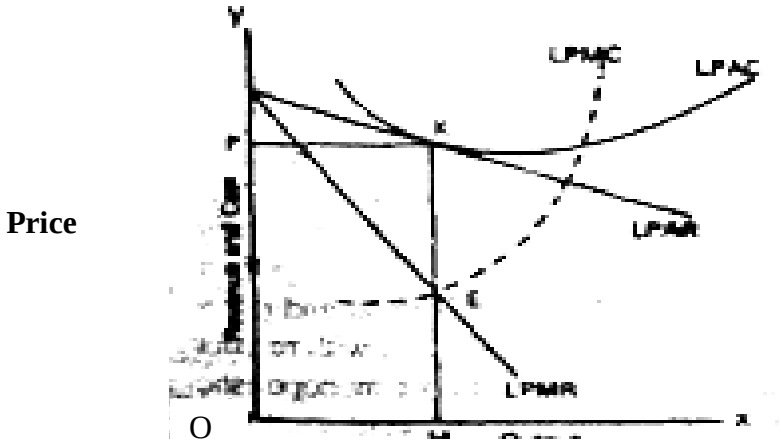
(ii) The firms competing have equal share of market demand which means that the shape of the AR curve will be the same for all.

(iii) All firms have equal efficiency in production and therefore cost curves are similar; and

(iv) The number of firms is fairly large and each firm regards itself as independent in the group.

These assumptions of Chamberlin actually boil down to the conditions of perfect competition with minor differences.

The abnormal profits earned in a short period will attract newcomers to the group. The newcomers will fix lower prices than the price charged by the existing firms. This will compel the existing firms to reduce the prices. As a result of such a keen competition, price will fall. Consequently the AR curve will shift to a lower position. The AC curve will shift to a higher position due to increased demand on factors of production. Thus, the distance between AR and AC will be narrowed down and the abnormal profits will be removed. Ultimately the - firms will earn only normal profits. The group equilibrium in the long run under monopolistic competition is shown in the figure 20.3.



Price

Output

LPAR and LPMR indicate the long period average and marginal revenues. LPMC and LPAC show the long period marginal and average cost curves. The point E is the equilibrium where MR = MC and the output is OM. At the equilibrium output the average revenue or the price of the product is OP. The figure shows that the firm produces OM units and sells it at a price OP per unit making only normal profit. The figure shows that the AR curve just touches the AC curve at the level of equilibrium output. So the AC=AR. The firm is not making any abnormal profit but only normal profit. Over a long period of time under monopolistic competition every firm will earn only normal profit. This situation is exactly similar to the perfect competition, long run equilibrium. The main difference is that in perfect competition the AR curve is horizontal touching the AC curve at the lowest point showing that the AC is the minimum cost and the price is also minimum. But in monopolistic competition, the AR curve is sloping down. It touches the AC curve not at the minimum point but at the falling side (point K in the figure). So long as the shape of the average cost curve is 'U' shaped, the long-period equilibrium of a firm producing under monopolistic competition will necessarily result in smaller output than in perfect competition.

Since all the firms are producing on no-profit no-loss condition (Normal profit), there will be no tendency for the new firms to enter nor existing firms to go out. The group has come to equilibrium.

NOTES

NOTES

UNIT – IV

FACTOR PRICING

MARGINAL PRODUCTIVITY THEORY OF DISTRIBUTION

Assumptions of the Theory

1) The Marginal productivity Theory assumes perfect competition. Through perfect competition, the prices of factors throughout the market are assumed to be uniform and each factor receives the same remuneration at different places in the same market. Only on this condition, the marginal productivity shall be equal and the factor prices shall be uniform.

(2) All factors of production are assumed to be perfectly mobile as between different uses and regions. This assumption is essential, as it will be possible to have equi-marginal returns from different factors of production through the principle of substitution, without perfect mobility factors

(3) The different units of a factor of production are alike and homogeneous in all respects. It means that one unit is as efficient as that of the other unit. Without this assumption, substitution of factors cannot be worked out to increase production.

(4) The employer is interested in getting the maximum amount of profit. This basic assumption is essential in economic analysis. Only in the context of maximising profits, the producer uses the factor units in such way that the cost of the last unit employed is equal to the product of unit.

(5) All factor units are emp1oyed and that no unit is prepared to come for work for any remuneration which is less than the market remuneration. A full employment condition is assumed.

(6) Although the scale and proportions of factors of production are changeable, the technique of production is assumed to remain constant.

(7) The theory is assumed to applicable in the long period to prove that remuneration of a factor will be equal to both average and marginal productivity.

Based on these assumptions, the marginal productivity theory or distribution states that:

(i) the price or remuneration of a factor will depend upon the productivity or contribution that it makes to production;

(ii) the price of a factor is determined by the marginal productivity of that factor unit and it is equal to marginal productivity.

(iii) In the long period, the price of remuneration of factor unit will be equal to average product also.

Average and Marginal Product of a Factor

Productivity of a factor is of two types, viz., physical productivity and revenue productivity. Physical productivity refers to the amount of a commodity in terms of a physical unit, which a factor helps to produce. Since

factors of production are paid in terms of money, we convert physical productivity into money through the system of price, and this is known as revenue productivity. Suppose that there are 10 workers in a workshop producing 50 pens a day. The total physical product is 50 pens, and average physical product per worker is 5 pens. Suppose that the price of a pen is Rs. 2. The total revenue product is Rs.100 and the average revenue product is Rs. 10. There is how every one mistake in our argument. We have assumed that there are only workers producing funtain pens and that there are no other factors or that these factors are not contributing anything. In the alternative, if there is other co-operating factors also we deduct their share from the total output. In this way, we calculate total output for labour alone and then calculate average product for a unit of labour.

Now, revenue product can be further classified into average revenue product and marginal revenue product. Average product refers to the total revenue product divided by the total number of factor units which have helped to produce that output or average physical product price. Marginal revenue product, on the other hand, refers to the net contribution made to total product by employment of one more unit of a factor or marginal physical product price. Actually, we may distinguish between marginal revenue product (MRP) and value of marginal physical product (VMPP) :

MRP = Marginal Physical Product ×MR Price

VMPP = Marginal Physical Product × price

But under perfect competition in the product market, Price = MR and, therefore, marginal physical product multiplied by price or multiplied by MR will be the same. In this section we are assuming perfect competition in the product market and, therefore, MRP=VMPP. Under imperfect competition, MRP will be less than VMPP (see the end of this section for a distinction between MRP and VMPP).

Table 1: (Average and Marginal Revenue Products (Under Perfect Competition)

No.of workers	Total physical product (dozens)	Average physical product (dozens)	Marginal physical product (dozens)	Total revenue product (Rs.)	Average revenue product (Rs.)	Marginal revenue product (Rs.)
1	2	3	4	5	6	7
0	0	0	0	0	0	0
1	4	4.0	4	16	16.00	16
2	9	4.5	5	36	18.00	20
3	15	5.0	6	60	20.00	24
4	22	5.5	7	88	22.00	28
5	29	5.8	7	116	23.20	28

6	35	5.8	6	140	23.33	24
7	40	5.7	5	160	22.86	20
8	43	5.4	3	172	21.50	12
9	45	5.0	2	180	20.00	8
10	46	4.6	1	184	18.40	4

Let us illustrate average and marginal revenue products with the help of a table. In Table 1 we are taking only one factor of production i.e., labour, in a small hosiery factory assuming that all other factors are given and we are assuming that all output is due to labour. We are also assuming that the price is Rs.4 per dozen pairs of socks and that the price is constant (the assumption of perfect competition).

In columns 2, 3 and 4 we have marked total physical product, average physical product and marginal physical product. These three columns have columns have been prepared on the basis of the law of variable proportions or the law of eventually diminishing returns. As more units of labour (variable factor) are applied to other factors (fixed), the total product rises first at an increasing rate and later at a diminishing rate; or average and marginal physical products rise, reach maximum points.

Columns 5, 6 and 7 explain the calculation of total revenue product (TRP), average revenue product (ARP) and marginal revenue product (MRP). They have been calculated by taking the relevant physical product and multiplying it by the price (Rs.400) which has been assumed to remain constant throughout. For instance, when 5 workers are employed, the total physical output is 29 dozens and the total revenue product is Rs. 116 (29×Rs.4). The average physical product for 5 workers is 5.8 dozens and average revenue product is Rs.2320. The marginal physical product is 7 dozens and marginal product is Rs.28OO. Since workers are paid wages in terms of money, we are interested in the revenue product rather than the physical product.

Fig . 1

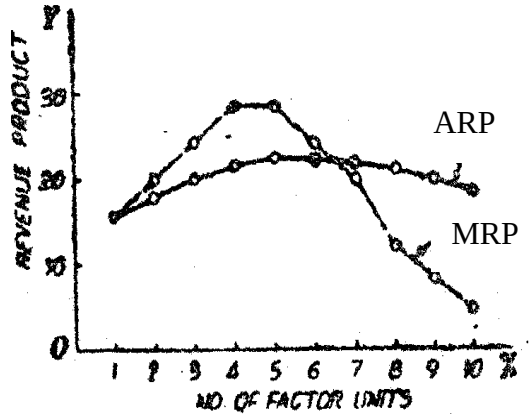
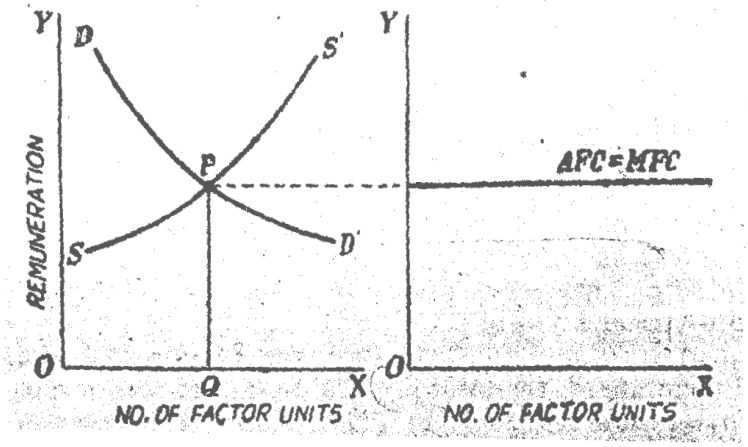


Table 1 show that the ARP and the MRP rise (because of increasing average and marginal physical returns) and eventually decline (due to diminishing average and marginal returns). Moreover) the MRP rises at a greater rate than the ARP and declines at a faster rate. In Fig. 1 the ARP and MRP curves rise and then decline—MRP, of course, rises at a higher rate and declines more rapidly and intersects the ARP at the highest point of the latter. We have so far explained the productivity of a factor of production. But how many units of a factor will be employed by a producer will or depend not only on productivity but also upon the cost of the factor to the producer

Average and Marginal Factor Costs

While the producer gets revenue by employing a factor of production, be will also have to incur some costs on that factor. The remuneration which the producer pays to a factor is income for the factor but an expenditure or cost to the employer. Under perfect competitive conditions, the remuneration of a factor is determined by market forces of demand and supply for that factor. After the price of a factor is determined, every employer has to pay what the market as a whole has determined. This is shown in Fig. 2. In this figure, on the left we have the remuneration of a factor is determined by demand and horizontal straight line from point represents the remuneration which every employer must pay. No employer would like to more and no factor unit will be prepared to accept less.

Fig . 2



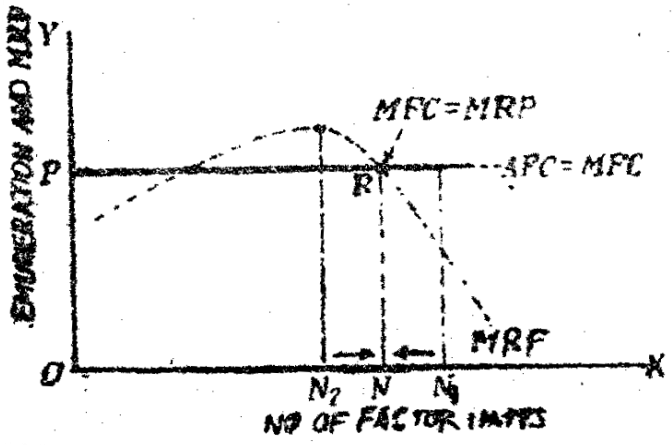
From the point of view of the firm, this horizontal line may be called the price of a factor service or average factor cost (AFC) and marginal factor cost (MFC). As the cost curve of a factor is a horizontal line o a producer the average factor cost and marginal factor cost of the factor are the same to the producer. The AFC curve can also be taken as average remuneration curve for a factor.

Factor Cost and Marginal Revenue Product

We can now show the relationship between the product and the remuneration of a factor. In Fig. 3 the marginal revenue product curve (MRP) and the factor cost curve (AFC=MFC) are given. At point R the marginal factor

cost (MFC) and the marginal revenue product are equal. This is the point of equilibrium.

Fig . 3



Beyond point R, the marginal revenue product is less than the MFC; that is, beyond R, the revenue which the producer gets for additional units of the factor (say NN1) is less than the payment he has to make. Hence the employer will not engage factor units beyond ON. At point R, MFC, which is also AFC for the factor units, is equal to the marginal revenue product of the factor. We can summarize this as follows

At the point of equilibrium,

MFC=MRP

MFC=AFC

AFC=MRP

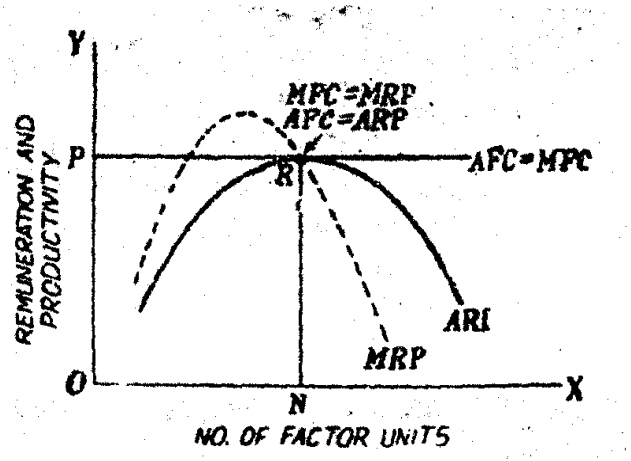
Thus we reach a simple conclusion that under perfect competitive market the remunerations of a factor is determined by and is equal to the marginal product of that factor. This is the substance of the marginal productivity theory of distribution.

Remuneration of a Factor and average Revenue Product

So far we have explained that under conditions of perfect competition, the remuneration paid to a factor will be equal to the marginal product of that factor (MFC=MRP). This will be so under all periods because the equality condition is implicit in the assumption of maximum profit. This is the basic relationship. But it is possible to work out the relationship between average productivity and the remuneration of a factor. In the short run, it is possible for the average remuneration of a factor to be more or less or just equal to average productivity of the factor. If the remuneration for a factor is more than the average revenue product, the firm will run on loss. Suppose that the average wage of 100 workers in a factory is Rs. 10 per day but average product of a worker is Rs. 8 per day. The total daily wage bill will be Rs. 1,000 but the total product of labour will be Rs. 800 resulting in a loss of Rs. 200 per day. The

firm may be prepared to incur such a loss in the short period with the hope that the situation would improve in the long run. But if the average wage is expected to be higher than the average product in the long run also, the firm will leave the industry. In other words, over a long period the remuneration of a factor cannot exceed its average revenue product. Likewise, if the remuneration of a factor is less than its average revenue product, the firm will get profit by employing more units of that factor.

Fig . 4



In the first case, the tendency for firms will be to leave the industry and thus bring about reduction in demand for the factor whose average remuneration is higher than its average revenue product, and thus ultimately, reduce the remuneration of such a factor. In the second case, new firms will enter the industry (we are assuming perfect competitive conditions) and thus raise the demand and consequently the remuneration of that factor whose remuneration is less than its average product. Whatever may happen in the short run, the remuneration of a factor unit cannot be more or less than its .average revenue product but will have to be equal to it in the long run. This as illustrated in Fig.4.

In Fig. 4, point R is the equilibrium. At point R, MFC is equal to MRP. At the same point, AFC and ARP are also equal. Now average and marginal remunerations are one and the same (AFC=MFC). Therefore, at point R, the remuneration of the factor (both average and marginal) will be equal to average and marginal revenue products of the factor. This conclusion applies to all factors of production. Suppose that the factor under consideration is labour. We can recast our conclusion thus : The wage of labour (average as well as marginal wage) will be equal to average and marginal product of 1abour. Likewise, in the case of capital, we will say that the interest of capital will be equal to the average and marginal product of capital.

The marginal productivity theory, therefore, states that under conditions of perfect competition and in the long period, the remuneration which a factor unit gets will be equal to both the marginal as well as average product of that factor.

A very interesting point should be noted in Fig. 4. In this figure, the value of the total product contributed by the factor units is equal to the total remuneration received by them. For example

No. of factor units employed	= ON
Average factor cost	= NR
Total factor cost (or remuneration)	= ONRP
Average revenue product	= NR
Total revenue product	= ONRP

This implies that whatever a factor, say, labour, contributed by way of production (total revenue product) is received by the factor by way of remuneration. There is no exploitation of the factor by the employer.

Under the assumption of perfect mobility of factors, the marginal productivity theory of distribution asserts that the reward, which each factor gets, tends to be equal to its marginal productivity in all occupations. For if this is not so, the units of a factor will move away from those uses where the reward is less to those uses where it is high. As a result of this free mobility, in due course of time a given amount of a factor of production tends to be distributed between different uses in such a way .that its marginal product in each use is equal. For instance, if the marginal product of labour in one employment is higher than in another, it will move from the latter to the former employment. A larger supply in the former employment will lower marginal productivity there and a smaller supply in the latter will raise its marginal productivity. This process of shifting will continue till the marginal product in both the employments is identical.

The marginal productivity theory therefore, states that, in equilibrium.

(i) the marginal productivity of a factor of production is equal in all employments.

(ii) the marginal product of each factor of production is equal to that of every other factor of production in the same employment, and

(iii) the price of a factor of production equal to the value of its marginal product.

Critical Evaluation of the Theory

The marginal productivity theory was regarded as a general theory of distribution, useful in explaining the rewards of all the factors of production. But the theory has been criticised vehemently, particularly for its assumptions.

(i) The assumption of perfect competition is extremely unrealistic for perfectly competitive conditions are not met with either in the commodity markets or in factor markets. In the actual world, imperfect rather than perfect competition is the rule. Under imperfect competition in the commodity market, the price of the product will be higher than marginal revenue. Hence marginal physical product multiplied by

price (i.e., value of marginal physical product) will be higher than marginal physical product multiplied by MR (i.e. MRP). The employer will pay a wage equal to MRP, but this will be lower than the value of the marginal physical product. If, the other hand, there is imperfection in the factor market, the AFC and MFC will diverge and employers will succeed in paying workers an average wage which is less than MRP. The former is known as monopolistic exploitation and the latter is called monopsonistic exploitation.

(ii) The assumption of homogeneity of factor units is unrealistic in practice. This assumption is necessary to show equal efficiency and equal remuneration for all units of a factor. In practice no two units of any factors can be equal in all respects. No two plots of land can have the same fertility. No two workers can have the same efficiency. It is incorrect, therefore, to assume that the various units of a factor are uniform and interchangeable.

(iii) The third assumption that every employer maximises his profits is questioned often. For one thing, an employer may be satisfied with normal or fair or just profits. Hence, the equality of marginal revenue product and marginal remuneration may not hold good. In some cases, the employer may be moved by such non-economic considerations as mercy for the poor and the unemployed. For instance, be may be prepared to employ more workers, even beyond the optimum point, if he is moved by the suffering of unemployed workers.

(iv) The assumption of full employment may not be possible. It is true that under conditions of full employment no worker will offer himself for any, remuneration less than the, value of the in marginal physical product. But if an economy works below the level of full employment, workers will be available for work, without bothering about their contribution to productivity.

(v) A very important criticism is implied in the assumption that production can be increased or decreased by changing the factor units small quantities. This may be true of small business units. But in large production units which employ lumpy factors as, for instance, large capital equipment the addition or contraction of a few labour units will have no influence at all. Hence, production cannot be varied by varying the quantity of a factors of production; and marginal productivity cannot he calculated by changing the number of factors units. Besides, a many lines of production the addition of a factor unit will mean addition of other factors

also. For instance, additional workers will have to be provided with capital equipment. Average and marginal productivity in other words, is the result of co-operation viz., (a) cooperation between different factors like capital and labour and (h) cooperation between different units of each factor. Under these circumstances, marginal productivity of any one factor alone can neither be calculated nor should it be calculated.

(vi) Perfect mobility of factors as between different employments and regions is another assumption of the theory which is shown to be impossible in practice. There is a certain degree of mobility but there is consideration immobility too. Accordingly, factor units get different types of remuneration in different industries or regions and in most cases remuneration is not at all related to their productivity.

(vii) The theory of marginal productivity assumes a long period for some of its conclusions. But the long period as Keynes points out, never comes, and besides, most of our economic problems are short- period problems. The critics argue that the marginal productivity theory does not explain properly the determination of the prices of factors of production in the actual wor1d.

(viii) Yet another criticism of the marginal productivity theory is that it is subject to " the fallacy of begging the question". The theory attempts to show that under certain assumptions, the remuneration of a factor is determined by and is equal to marginal productivity of that factor. But actually, the theory does not answer the question of how the price of a factor is determined. Instead, it assumes perfect competitive conditions and a constant price for the factors of production.

Theories of Distributions:

Rent:

2. The Ricardian Theory of Rent

Just as the Malthusian theory of population has been the basis for all further studies in population, the Ricardian theory of rent has been the basis for all discussions on the problem of rent. The theory is named after David Ricardo, an eminent economist of the 19th century. It is one of the earliest and popular explanations of the nature of rent.

According to Ricardo, "rent is that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil." So, according to him, rent is a payment made for the use of the "original and indestructible powers of the soil." In other words, in the strict sense, rent is a payment made for the use of land. Ricardo believed that rent arose on account of the differences in the fertility of land. All lands are not

equally fertile and so lands of superior fertility command an advantage over the others. Superior lands get rent. Rent is a differential surplus.

Ricardo explained his theory of rent with the aid of an example of colonization. Suppose some people go to a new country and settle down there. To begin with, they will cultivate all the best lands available. There may be no need, to pay rent so long as such best lands are freely available. Suppose another batch of people goes and settles down in the new country after some time. Naturally, the demand for agricultural produce will increase. And in course of time, the first-grade lands alone cannot produce all the food- grains that are needed, on account of the operation of the law of diminishing returns. The law of diminishing returns is the basis of the Ricardian theory of rent. So the second-grade lands will have to be cultivated in order to meet the needs of the growing population. If the second-grade lands are to be brought under cultivation, the price of the grain prevailing in the market must be sufficient enough to meet the cost of production in the second-grade land. Otherwise., the second-grade lands will go out of cultivation. Since under conditions of competition, there will be only one price for a commodity, all the produce, whether it is from the first-grade lands or from the second-grade lands will have the same price. When the second-grade lands are cultivated, the first-grade lands will yield a surplus over and above their expenses of production. This surplus is called rent. In our present example, only the first- grade land yields rent. The second-grade land covers only the expenses of production. But suppose the demand for foodgrains further increases. Then, inferior lands (in our. example, third-grade lands) will be brought under cultivation. Now, even the second- grade will yield rent and the rent of the first-grade lands will increase further. The land that is just able to meet its expenses of production is known as no-rent land. Rent indicates the differential advantage of the superior land over the marginal land. While discussing the relationship between rent and price, Ricardo has stated that rent does not enter price. According to him, rent is price- determined. i.e. it is determined by price. Rent is high because price is high and price is high not because rent is high. Ricardo came to the conclusion that rent did not enter price, because according to him, there are some no-rent lands. But still their produce has a price on the market and rent does not enter price here because the marginal lands do not get any rent at all.

Rent arises on account of differences in the fertility of land. Besides differences in fertility, rent may also arise on account of situational advantage. Some lands enjoy situational advantage. For example, they may be nearer to the market. That may help them in saving a lot of transport costs. Even if all lands are equally fertile, lands possessing situational advantage command some superiority over other lands. Thus rent arises on account of differences in fertility and in situation.

Quasi-Rent

The concept of quasi-rent has been introduced in economics by Marshall. According to him, "quasi-rent is the income derived from machines and other appliances for production made by man.''

In economics, the term rent is generally used to denote the income from factors whose supply is permanently inelastic. Land is the main example of such factor. Its supply is fixed both in the short-run as well as in the long-run. In the short-run, the supply of machines and other man-made goods also is inelastic. Suppose there is an increased demand for machines. In the short-run, the supply of neither land nor machines can be increased to meet changes in demand. So in the short-run, whenever there is a rise in demand for machines and other man-made appliances, they will earn an income something similar to rent. This surplus income which is earned by machines in the short-run and which will disappear in the long run has been described as quasi-rent. The difference between land and man-made appliances is that the supply of land is permanently fixed while that of the latter is fixed only in the short-run. In the long-run, the supply of machines and other man-made goods can be adjusted to meet changes in demand.

For example, suppose the demand for fish increases during a given period. It means an increase in demand for boats and nets. But the supply of boats and nets cannot be increased immediately. So for some time, they may earn some extra income similar to rent. If demand for fish continues to remain at the higher level, in course of time, new boats and nets will be produced and their supply will be adjusted to changes in demand. Incomes from boats and nets will once again fall to the normal level. Then quasi-rent disappears.

Thus the increase in incomes of machines and other man-made appliances over a short period is known as quasi-rent. It is rent because it is income from a factor whose supply is fixed and it is 'quasi' because the inelasticity of supply is a temporary feature and the rent that arises out of such a condition is only a temporary phenomenon.

Wages:

Theories of Wages

1. Subsistence Theory of Wages

According to the subsistence theory, the sum that is paid to the worker as wages must be just enough to cover his bare needs of subsistence. The followers of the theory believed that in the interest of the workers, the level of wages at any time should not exceed the subsistence level. They argued that if workers were paid higher wages, that would tend to increase population. This, in turn, would increase the supply of labour. On account of competition for jobs, wages would fall once again. Their argument seems to be that an increase in wages would sooner or later result in a fall in wages. So in order to prevent a fall in wages, workers should not be paid more than what is necessary to keep them at subsistence level, and wages cannot be paid below the subsistence level because it would cause starvation, disease and death among workers. So there

will be shortage in the supply of labour and wages will go up. In the past, economists believed that the value of a commodity was determined by its cost of production. They regarded labour as a commodity and the subsistence wages as the cost of producing labour.. The subsistence theory is also known as the Iron Law of Wages.

2. The Standard of Living Theory

The standard of living theory is an improvement on the subsistence theory. While the subsistence theory tells that wages paid to a worker must be just sufficient to provide for his subsistence, the standard of living theory makes allowance for some comforts and a few luxuries besides the basic needs. The theory tells that wages are determined by the standard of living of workers. If standard of living is high, wages will be high (e.g. the U.S.A.). If standard of living is low, wages will be low (e.g. India).

3. The Wage-fund Theory

The wage-fund theory is associated with the name of J. S. Mill. Instead of saying that Mill originated the Wage Fund doctrine, it may be right to say that he popularized the doctrine.

According to this theory, "wages depend upon the proportion between population and capital".

The argument of the theory runs more or less in the following manner. At any time, a fixed amount of capital is allotted for payment of wages to labour. This is the wage fund. It represents the demand for labour.

By population, Mill means here the number of the labouring class or rather those who work for hire. At any time, there will be a fixed number of workers willing to work. It represents the supply of labour. Wages at any time are determined by the ratio between the amount of wage-fund and the total supply of labour. In other words, wages depend upon the proportion between the number of workers and the capital that forms the wage fund. The fund remaining the same, if there is an increase in the supply of labour, wages will fall. The advocates of this theory under the influence of Malthus, believed that a general rise in wages would increase the population which in turn would lead to a fall in wages.

Certain things follow from the wage-fund doctrine. The wage- fund doctrine was used to show that attempts made by workers by means of trade union activity are useless. If workers in a section of industry managed to get an increase in wages by trade union activity, workers employed in other firms would be affected. The wage-fund remaining the same, they would get lower wages. Further, wages can rise only at the expense of profits. When profits fall savings will fall and this will affect the growth of capital. This, in turn would affect the demand for labour. So the only way by which workers can improve their lot is by discouraging the growth of population. So the general rise in wages is impossible unless the supply of labour is regulated by controlling the increase in population. The influence of the Malthusian theory can be seen here quite clearly.

The wage-fund doctrine was used as a basis for opposing trade unionism. But Mill believed that workers had every right to combine to raise their wages. So he abandoned the doctrine in later life.

1. The Marginal Productivity Theory of Wages

The marginal productivity theory of wages is nothing but an application of the marginal productivity theory of distribution (i.e. the general theory of distribution). The theory tells how wages would be determined under conditions of perfect competition. According to this theory, wages will be equal to the value of the marginal product of labour.

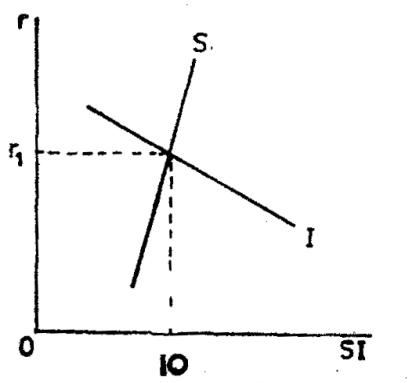
The demand for labour is derived demand. That is, an employer demands the services of a worker because his services are needed for the production of some goods. In other words, he demands labour because it is productive. As an employer goes on increasing the units of a factor, the returns from additional units will diminish sooner or later. This is on account of the influence of the 1aw of diminishing returns. An employer will go on increasing more and more units of labour until the wages be pays are equal to the value of the marginal product. In other words, wages are determined by the marginal product of labour. The marginal (revenue) product of labour is equal to the value of the additional product which an employer gets when he employs an additional unit of labour, the supply of all other factors remaining constant. It is assumed that all units of labour are uniform. So the productivity of the marginal unit of labour settles the rate which is to be paid to all units of labour. This, in short is the marginal productivity theory of wages.

Interest:

4. Classical Theory (or Saving and Investment Theory) of Interest

Interest is the price of capital. According to the classical theory of interest, the rate of interest is determined by the supply of capital which depends upon savings and the demand for capital for investment. The theory assumes that there is a direct relationship between the rate of interest, savings and investment.

The classical economists believed that saving and supply of capital would increase whenever the rate of interest went up. In other words, classical theory treated saving as a direct function of the rate of interest. As rate of interest was considered a measure of the reward for saving, the classical economists believed that the higher the rate of interest, the greater would be the volume of saving. Not only that, they treated investment as an inverse function of the rate of interest. In other words, as interest was treated as the "price" of capital goods, whenever there was a fall in the rate of interest, there was increase in investment and vice versa. The rate of interest is determined by the intersection of saving and investment functions. The classical economists also believed that equilibrium between saving and investment was brought about by the rate of interest.



Savings and investment

Fig. 21.1 : Classical Theory of Interest

From Figure 21.1, we can see that only when the rate of interest is r, there is equilibrium between saving and investment. Any rate above or below that results in disequilibrium.

Criticism

Firstly, the classical theory is based on the unrealistic assumption of full employment. Secondly, the theory does not take into account the effect of investment on income and saving. In fact, according to Keynes, saving is a direct function of income. When the rate of interest goes up, saving cannot always increase. When rate of interest rises, investment falls. When investment falls, employment falls, income falls and saving decreases. Thirdly, besides the rate of interest, savings depend upon other factors such as time- preference and liquidity preference. Fourthly, the theory assumes that when there is a fall in the rate of interest, there will be an automatic increase in demand for capital for investment purposes. This, however, is not always the case. For, during a period of depression, the rate of interest may be low. But it will not result in an increase in demand for capital because marginal efficiency of capital (expected rate of profit) will be low during such periods. Lastly, when we consider the supply of capital, we must also take into account bank credit. The loanable funds theory includes it.

6. The Liquidity Preference Theory (or Keynesian Theory) of Interest

Keynes rejected the classical notion of rate of interest as the reward for saving or waiting as such. The classical economists believed that saving was influenced by the rate of Interest. But Keynes thought saving depended much more on the level of income. Not only that, he argued that money is demanded not only for spending on capital goods. There was also demand to hold money in the form of cash rather than in any other type, securities, buildings etc. Cash is a liquid asset. It is readily accepted in exchange for goods and services.

According to Keynes interest ‘is the reward paid for parting with liquidity. In other words, it is the reward for not hoarding.

We have already noted that liquidity preference refers to the desire of the people to hold their assets in the form of cash. The Keynesian theory of interest is also known as monetary theory of interest.

Motives for Liquidity Preference

Keynes has given three important motives for liquidity preference : (1) the transaction motive; (2) the precautionary motive; and (3) the speculative motive.

1. Transaction Motive

This money is held to finance day-to-day spending. The amount of money held for transaction motive will vary normally with changes in both the income and the price level.

2. Precautionary Motive

This money is held to meet an unforeseen expenditure. Keynes described the money held for transaction and precautionary motives as active balances. He argued that the demand for money for these motives will be fairly stable in the short run and they would not be influenced by changes in the rate of interest.

3. Speculative Motive

Keynes defines speculative motive as "the object of securing profit from knowing better than the market what the future will bring forth." Any money held in excess of the amount required 'for transaction and precautionary motive has been described by Keynes as idle balances.

Of the three motives, speculative motive is more important in relation to the rate of interest. Although the rate of interest is closely related to the speculative motive, the other two motives cannot be ignored because money held for' one purpose is a perfect substitute for money held for other purposes.

The total demand to hold money (i.e. liquidity preference) can be calculated at any given time by adding together all the active and all the idle balances. Keynes expressed the view that while active balances did not vary with the rate of interest, idle balances varied inversely with the rate of interest. In other words, the amount of money held for speculative motive would vary inversely with the rate of interest.

The Supply of Money

After introducing the concept of liquidity preference, Keynes said that the rate of interest was determined by liquidity preference on the one hand and the supply of money on the other. The classical economists looked at the supply of money only in terms of the level of current saving. But in addition to saving, Government can print money and banks also can create money (credit) within certain limits. Keynes was of the view that the supply of money at any time was determined by the monetary authorities and it was more or less fixed in the short run.

Keynes explained the determination of the rate of interest in terms of the intersection between the demand curve for money (liquidity preference curve) and the supply curve of money.

Diagrammatic Illustration of Keynes Liquidity Preference Theory

The determination of interest and the effects of changes in preference and the money supply are shown in Figure 21.3. To begin with, with liquidity preference represented by curve L.

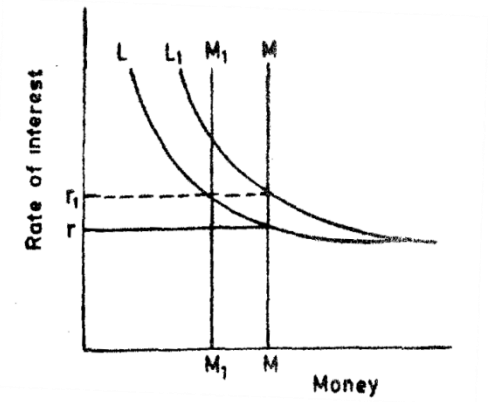


Fig. 21.3 liquidity preference theory

and supply of money represented by M, the rate of interest is r. It is determined by the intersection of L and M curves. Au increase in the rate of interest 1, could have been a used either by an increase in the demand for money to L1 or by a fall in the supply of money to M_1 .

PROFIT:

Innovation Theory of Profit

Schumpeter has explained profits in terms of innovation. He considered economic life as essentially a process of change and development. He was mainly interested in explaining the theory of the capitalist economic development and business cycles. According to him, the essential process in economic change is the introduction of innovations and innovations are introduced by the entrepreneur who is the central figure in the scheme of economic development. Innovation of new goods, or new methods of production, opening new markets, conquering new sources of supply and things like that. We should remember that innovation is something more than invention. An invention becomes an innovation only when it is applied to industrial processes.

Without the activities of the entrepreneurs and their innovations, economic life would reach static equilibrium. Profits and interest would disappear and there would not be an accumulation of wealth. The entrepreneur, who is guided by the profit motive seeks profits through innovation and be transforms the static situation into the dynamic process of economic development. So profits are the reward for innovation. We may note here that profits are the cause as well as the effect of innovations. The entrepreneur who introduces innovations will, make profit. Soon, others will follow suit and

profits will be eaten away. However, this will take time. Until then, the original entrepreneur may be earning large profits.

6. The Risk-Bearing Theory of Profits

Professor Hawley is the main advocate of the theory. According to him, profits are the reward for risk-taking. Risk-taking is an essential function of the entrepreneur. So an entrepreneur is rewarded by way of profits for risk-taking. The functions of the entrepreneur are of a special nature and they are different from those of land, labour and capital. Profits cannot be the reward of management. Risk-taking is a necessary- condition of modern production. But, it is a very unpleasant thing. Risk-taking and profit making go together.

7. The Uncertainty-bearing Theory of Profits

Professor Knight is the author of the uncertainty-bearing theory of profits. According to him, 'profit is the reward not for risk bearing but uncertainty-bearing'. He accepts that dynamic changes and risk-bearing are all important elements that give rise to profit.

His main point is that there is risk because future is uncertain. Uncertainty-bearing is an essential function of the entrepreneur. If future were perfectly known, there would be no risk and therefore no profit. So uncertainty-bearing is the basic cause of profits.

Risks may be divided into two kinds (1) insurable risks and (2) non-insurable risks. For example, risk of loss of property due to fire can be insured against. But there are risks such as competition risks, business cycle risks, risk of government action which cannot be insured against. The non-insurable risks are uncertainties. The entrepreneur gets profits because uncertainties are borne by him.

NOTES

UNIT – V

NATIONAL INCOME

Definitions of National Income

Before studying the different methods of measuring national income, it may be useful to discuss a few definitions and concepts of national income.

Marshall defined national income as follows: "The labour and capital of the country acting on its natural resources produce annually a certain net aggregate of commodities, material and immaterial, including services of all kinds.... This is the net annual income or revenue of the country, or the national dividend." If we adopt Marshall's approach, there must be a larger statistical apparatus for conducting census on a vast scale.

Professor Pigou has defined national income as follows "The National Dividend is that part of the objective income of the community, including, of course, income derived from abroad which can be measured in money."

An important thing about the definition of Pigou is that while suggesting the income method for calculating the national income, it takes into account only those goods and services which are actually bought and sold for money. But this approach may result in certain anomalous situations. Professor Pigou himself has realized that "the bought and the unbought kind do not differ from one another in any fundamental respect, and frequently an unbought service is transformed into a bought one and vice versa." (Pigou Economics of Welfare).

According to Irving Fisher, "The National Dividend or Income consists solely of services as received by ultimate consumers, whether from their material or from their human environment." Thus a piano or overcoat made for me this year is not a part of this year's income, but an addition to capital. Only the services rendered to me this year is capital.

Fisher's approach relates the concept of national income directly with economic welfare by emphasizing that national income consists solely of services as received by ultimate consumers. The main point of criticism against Fisher's definition is that it results in some practical difficulties. It is rather difficult to make a correct estimate of the consumption of a community during a given period.

According to the National Income Committee of India, "a national income estimate measures the volume of commodities and service turned out during a given period counted without duplication."

Concepts of National Income

1. Gross National Product (G.N.P.)

The Gross National Product (GNP) is the most comprehensive measure of net output. In a simple way, we may define the GNP as 'the value of all goods and services produced annually in the nation.' We must remember that

the GNP is a flow. It is an amount of production per unit of time. Usually, we measure GNP in terms of annual flows.

(a) Gross National Product (GNP) and Gross National Income (GNI):

Production flows generate income flows. The flow of GNP will be matched by GNI. We may, therefore, say that GNI is the sum of all incomes (wages, profits, rent, interest etc.) earned, in the production of GNP.

(b) Gross National Product at market prices

When we measure the GNP, usually the values of commodities and services are measured at market prices. So part of the GNP represents indirect taxes on the goods produced. These taxes are paid to government and hence the amounts represented by taxes are not available to be paid out as incomes to the employees or owners of the business.

(c) Gross National Product at Factor Prices

For some purposes, indirect taxes are deducted from the GNP (at market prices). The result is known as GNP at factor prices.

2. Net National Product

By passage of time and owing to constant use, machinery will be subject to physical wear and tear. It is known as depreciation. So, if the business is to continue, depreciation must be made good from time to time by repairs-renewals and replacement of assets which have become worn out. Some reserve must be set aside for depreciation. Again some machines may become obsolete, that is, out of date. Though they might be in good physical condition, it may be necessary to replace them by newer types. Thus depreciation reserves cover obsolescence as well as physical wear and tear.

For some purposes, depreciation should be deducted from the Gross National Product. The resulting figure is known as Net National Product (NNP). (Net National Product may be measured either at market prices or after deducting indirect taxes at factor prices). Net National Product is also known as net national income or simply national income.

3. National Product and National Income

In some cases, a discrepancy may arise between national product and national income if a country makes interest payments to the rest of the world. For instance, during the early plan periods, India borrowed huge sums from other countries. And now part of our output is neither consumed at home nor exchanged for imports. it goes away as “unrequited exports” to pay interest on loans borrowed abroad or to pay profits on investments made in the country by foreigners. So India’s national income available for distribution is her national product less such payments made abroad.

Conversely, a country may receive interest payments, dividends etc. from abroad. Then it will make her national income greater than her national product.

From the above concepts, we may write, Gross national product minus depreciation = net national product = national income (National Income, in turn, is equal to consumption plus net investment).

4. Potential GNP

Potential GNP is also known 'full employement' level of GNP. When we refer to GNP, usually we refer to actual output. Potential output is that output which could be produced if the labour force were fully employed and industrial capacity fully utilized. Full employment does not mean that there is 100 per cent employment. When the rate of unemployment is not more than 3 per cent, we may say there is full employment in the economy. And when manufactuing plants are operating at 90 to 95 per cent of capacity we may say they are fully utilized.

Sometimes, prosperity is judged by the relationship of actual GNP to potential GNP. The size of the gap between the actual and the potential GNP will give us a measure of seriousness of economic depression.

5. Per Capita Income

We get per capita income (i.e. income per person per year) by dividing national income by the population of the country. But for comparing the national incomes of two countries, the best way is to compare real national income per head, where allowance must be made for differences in price levels.

6. Domestic Product versus National product

Domestic product refers to what is produced within the domestic territory of a country and national product refers to what is produced by the residents of the country including the return on the overseas assets that they own. The difference between national and domestic product is known as net income from abroad and it be positive or negative.

Computation of National Income:

There are three methods of computation of national income. They are-

(i) Census method or Product method;

(ii) income method;

(iii) Expenditure method.

(i) Census Method or Product Method:

By this method the total products produced in, the economy is calculated for the year and the value of this flow is equated to the market price avoiding double counting. The economy is classified into convenient sectors, viz., agricultural, industrial, direct services and foreign transactions, etc. In each sector we make inventory of goods produces and find it out the end product making an addition to the value of goods. Here, care should be taken to avoid double counting. For instance, the value of shoes produced in the economy may enter in the form of leather first and then finished shoes. So, to avoid this double counting, only end-product alone should be calculated. Similarly in the production of books in the economy, the value of paper may enter under paper production first and then book production. In the direct

services sector, the value of services of such profession like doctors, dramatists, soldiers, professors and politicians etc., is taken by equating their salaries to the services. In the international transactions, the value of goods imported is subtracted from that of the goods exported; the claim of foreigners is deducted from the balances created abroad by nationals to arrive at the net addition.

The results of these sectors, when combined, get net national product or national income. This census or product approach can be expressed through the formula 0 = C + I; where 0 stands for output, C stands for consumption goods and I for investment goods.

(ii) Income Method:

According to this method, the incomes or factor earnings of the economy are calculated and the net national product is the sum total of factor earnings of the economies and products. It is customary to refer to factor earnings as consisting of wages, interest and profit.

Incomes are earned either from property or through work. To arrive at the totality of income of a nation, the following procedure will be adopted.

(a) First, about net rents including the rental value of owner occupied houses. This information is processed in the income tax department.

(b) Next about wages, salaries and all such earnings of persons employed. This is a straight and simple issue. Pensions, however, are excluded.

(c) Earnings by way of interest occurred.

(d) The incomes of joint stock companies

(e) Incomes of unregistered business units; and

(f) Finally we have incomes from overseas investments.

This is the national income at factor cost. In Keynesian language, the formula here is; Y = C+ S. Y stands for total income, C for consumption and S for savings.

(iii) Expenditure Method:

One man's income is another man's expenditure. Hence, in order to find out the total income we can find out the total expenditure or outlay. Using the keynesian formula Y = C + I, some chosen to call it consumption and investment method. The American economist Samuelson names if flow-of-product approach. In English, countries it is known as outlay method.

It is the expenditure on finished product that is reckoned in this connection. Expenditure or outlay on final products takes place in three ways:

(a) Expenditure by consumers on goods and service.

(b) Expenditure by private manufacturer on capital or investment goods;

(c) Expenditure by government on consumption as well as capital goods. To this one should add.

(d) moneys received from export of goods and services and incomes received on foreign investments.

In backward countries, it would not be possible to use any one of the methods exclusively. All the methods may have to be used. The National Income Committee appointed by the Government of India with Prof. P. C. Mahalanobis as Chairman made use of different methods in different sectors while calculating the National Income of India. Normally, primary sectors in India would lend itself to product or census method. It is also easy to apply product method in industries. In the case of trade, transport, administration and profession, income method would be quite suitable.

ECONOMIC FLUCTUATIONS AND TRADE CYCLE

TRADE CYCLES

Introduction

Trade cycle or business cycle is one of the characteristic features of the industrialized nations of the world. In fact, it is one of the main weaknesses of the capitalist system.

Trade cycle refers to the tendency of the business activity to fluctuate between prosperity and depression. Prosperity or boom is a period characterised mainly by good trade, rising prices and increasing employment. Depression or slump is characterised by bad trade, mass unemployment and falling prices. An upward movement of prices and employment over many years is succeeded by a downward movement.

Salient Features of Trade Cycles

(1) The length of a trade cycle, from peak to peak is usually about seven or eight years.

(2) No one cycle is exactly similar to any other cycle. As Prof. Pigou put it ‘‘all recorded cycles are members of the same family.’’ But there are no twins.

(3) Prices and production (outside agriculture) usually rise or fall together.

(4) Total expenditure on durable goods and capital goods fluctuates by a larger percentage than expenditure on non-durable goods and consumption goods. Therefore, total output and employment fluctuate by a larger percentage in former type of industries than in the latter.

(5) Large changes in total output and employment or in the price level are normally accompanied by larger change in currency, credit and velocity of circulation of money in the same direction.

(6) Profits fluctuate by a much larger percentage than other types of income.

Different Phases of trade cycle.

Business Cycle is characterized by different phases called the (i) Upward Phase and (ii) Downward Phase. Each phase has got sub-phases. Though there is no uniformity of terminology, the different phases of business cycle is referred to as : (a) Boom, (b) Recession; and (c) Depression; and (d) Recovery.

I. Boom or Prosperity Phase

The full employment and the movement of the economy beyond full employment is characterized as boom period. It starts with recovery and the expansion of business activities takes place. During this period, there is hectic activity in me economy. In a matter of months, full employment paves way for overfull employment. Money wages rise, profits increase and interest rates go up. The demand for bank credit increases and there is all-round optimism. This up-swing or the prosperity phase of the cycle is described by Prof. Haberler as "a state of affairs in which the real income consumed, real income produced and level of employment are high or rising, and there are no idle resources or unemployed workers, or very few of either." The important features of the upswing are: (a) Rising Prices (b) Large volume of production (c) High level of Employment and Job Opportunities (d) Rising interest rates (e) Bullish trends in stock exchange (f) Expansion of credit and borrowing (g) Rise in Wages, profits and income; and (h) Overall business optimism.

II. Recession

The turning point from boom condition is called recession. Generally, the failure of a company or a bank, bursts the boom and brings a phase of recession. Businessmen begin to realize that they have overstepped their mark and their over-optimism gives place to pessimism. Investments are drastically reduced, production comes down and income and profits decline. There is panic in the stock market and business activities show signs of dullness. Liquidity preference of the people rises and money market becomes tight. "A recession once started tends to build upon itself such as forest fire, once underway, tends to create its draft and gives an impetus to its destructive ability.

III. Depression

Recession is only a turning point rather than a phase. When this deepens, it culminated into depression. The features of depression are just the reverse of prosperity. During depression, the level of economic activity becomes extremely low. Prices fall, profit margins decrease, firms incur losses and closure of business becomes a common feature and the ultimate result is unemployment. Interest and wages also fall. The agricultural class and wage earners would be worst hit. There is all round pessimism. Depression is the worst phase of the business cycle.

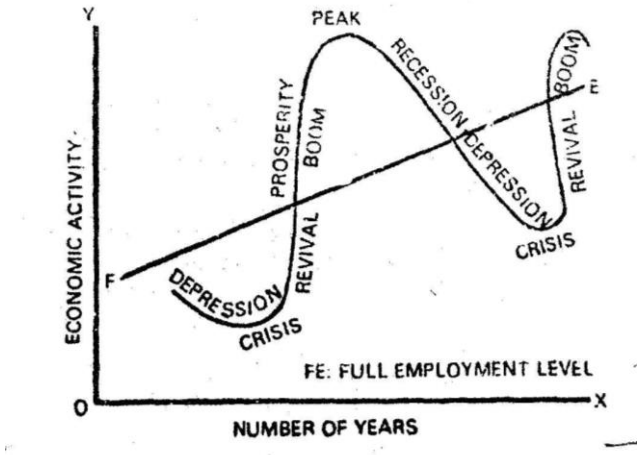
IV. Recovery

After a period of depression, recovery sets in. This is the turning point from depression to revival towards upswing. It beings with the revival of demand for capital goods. Autonomous investments boosts the activity. New blood, in the form of expansion of money and credit, is injected in the money stream of the economy and the income of the people goes up. The demand slowly picks up and in due course the activity is directed towards the upswing with more production, profit, income, wages and employment. Recovery may be initiated by innovation or investment or by government expenditure (autonomous investment).

The different phases of the business cycle are illustrated in the Figure 29-1

FIGURE 29 -1

Different Phases of Business Cycle



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