UNIT –I: BUSINESS ECONOMICS AN INTRODUCTION

Lesson: 1 – BASICS OF ECONOMICS

CONTENTS

1.0 Aims and Objectives

1.1 Introduction

1.2 Definition of Economics

1.3 Nature of Economics

1.4 Let Us Sum Up

1.5 Lesson End Activities

1.6 References

1.0 AIMS AND OBJECTIVES

After having studied this unit, you should be able

- **To Understand the fundamentals of Business Economics**
- **To Know whether Economics is a Science or an Art**
- **To Study the Basic Economic terminologies**

1.1 INTRODUCTION

Economics was formerly called political economy. The term Political economy means the management of the wealth of the state. "Adam Smith, the father of modem Economics, in his book entitled 'An Enquiry into the Nature and Causes of the Wealth of Nations' (Published in 1776) defined Economics as a study of wealth. Smith considered the acquisition of wealth as the main objective of human activity. According to him the subject matter of Economics is the study of how wealth is produced and consumed. Smith's definition is known as wealth definition.

This definition was too materialistic. It gave more importance to wealth than to man for whose use wealth is produced. The emphasis on wealth was severely criticised by many others. Cailyle, Ruskin and other philosophers called it the Gospel of Mammon. They even called it a dismal science as it was supposed to teach selfishness.

Later economists held that apart from man the said study of wealth has no meaning Economics is concerned not only with the production and use of wealth but also with man. It deals with wealth as serving the purpose of man. Wealth is only a means to the end of human welfare. We cannot consider the desire to acquire wealth as the inspiring factor behind every human endeavor. Nor can it be expected to be the sole cause of human happiness. The emphasis has now shifted from wealth to man. Man occupies the primary place and wealth only a secondary place.

1.2 DEFINITIONS OF ECONOMICS

Several definitions of Economics have been given. For the sake of convenience let us classify the various definitions into four groups:

1. Science of wealth
2. Science of material well-being
3. Science of choice making and
4. Science of dynamic growth and development

We shall examine each one of these briefly.

1. Science of wealth. Some earlier economists defined Economics as follows:

"An inquiry into the nature and causes of the wealth of the nations'' **by Adam Smith.** "Science which deals with wealth" by **J.B. Say.**

In the above definition wealth becomes the main focus of the study of Economics. The definition of Economics, as science of wealth, had some merits. The important ones are:

(i) It highlighted an important problem faced by each and every nation of the world, namely creation of wealth.

(ii) Since the problems of poverty, unemployment etc. can be solved to a greater extent when wealth is produced and is distributed equitably; it goes to the credit

2

of Adam Smith and his followers to have addressed to the problems of economic growth and increase in the production of wealth.

The study of Economics as a 'Science of Wealth' has been criticized on several grounds. The main criticisms leveled against this definition are;

(i) Adam Smith and other classical economists concentrated only on material wealth. They totally ignored creation of immaterial wealth like services of doctors, chartered accountants etc.

(ii) The advocates of Economics as 'science of wealth' concentrated too much on the production of wealth and ignored social welfare. This makes their definition incomplete and inadequate.

2. Science of material well-being. Under this group of definitions the emphasis is on welfare as compared with wealth in the earlier group. Two important definitions are as follows:

"Economics is a study of mankind in the ordinary business of life. It examines that part of individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being. Thus, it is on the one side a study of wealth and on the other and more important side a part of the study of the man", **Alfred Marshall**

"The range of our inquiry becomes restricted to that part of social welfare that can be brought directly or indirectly into relation with the measuring rod of money"

 A.C. Pigou.

In the first definition Economics has been indicated to be a study of mankind in the ordinary business of life. By ordinary business we mean those activities which occupy considerable part of human effort. The fulfillment of economic needs is a very important business which every man ordinarily does. Professor Marshall has clearly pointed that Economics is the study of wealth but more important is the study of man. Thus, man gets precedence over wealth. There is also emphasis on material requisites of well-being. Obviously, the material things like food, clothing and shelter, are very important economic objectives.

The second definition by Pigou emphasizes social welfare but only that part of it which can be related with the measuring rod of money. Money is general measure of purchasing power by the use of which the science of Economics can be rendered more precise.

Marshall's and Pigou's definitions of Economics are wider and more comprehensive as they take into account the aspect of social welfare. But their definitions have their share of criticism. Their definitions are criticised on the following grounds.

(i) Economics is concerned with not only material things but also with immaterial things like services of singers, teachers, actors etc. Marshall and Pigou chose to ignore them.

(ii) Robbins criticised the welfare definition on the ground that it is very difficult to state which things would lead to welfare and which will not. He is of the view that we would study in Economics all those goods and services which carry a price whether they promote welfare or not.

3. Science of choice making. **Robbins** gave a more scientific definition of Economics. His definition is as follows:

"Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses".

The definition deals with the following four aspects:

(i) Economics is a science: Economics studies economic human behaviour scientifically. It studies how humans try to optimise (maximize or minimize) certain objective under given constraints. For example, it studies how consumers, with given income and prices of the commodities, try to maximize their satisfaction.

(ii) Unlimited ends: Ends refer to wants. Human wants are unlimited. When one want is satisfied, other wants crop up. If man's wants were limited, then there would be no economic problem.

(iii) Scarce means: Means refer to resources. Since resources (natural productive resources, man-made capital goods, consumer goods, money and time etc.) are limited economic problem arises. If the resources were unlimited, people would be able to satisfy all their wants and there would be no problem.

(iv)Alternative uses: Not only resources are scarce, they have alternative uses. For example, coal can be used as a fuel for the production of industrial goods, it can be used for running trains, it can also be used for domestic cooking purposes and for so many purposes. Similarly, financial resources can be used for many purposes. The man or society has, therefore, to choose the uses for which resources would be used. If there was only a single use of the resource then the economic problem would not arise.

It follows from the definition of Robbins that Economics is a science of choice. An important thing about Robbin's definition is that it does not distinguish between material and non-material, between welfare and non-welfare. Anything which satisfies the wants of the people would be studied in Economics. Even if a good is harmful to a person it would be studied in Economics if it satisfies his wants.

No doubt, Robbins has made Economics a scientific study and his definition has become popular among some economists. But his definition has also been criticised on several grounds. Important ones are:

 (i) Robbins has made Economics quite impersonal and colourless. By making it a complete positive science and excluding normative aspects he has narrowed down its scope.

(ii) Robbins' definition is totally silent about certain macro-economic aspects such as determination of national income and employment.

(iii) His definition does not cover the theory of economic growth and development. While Robbins takes resources as given and talks about their allocation, it is totally silent about the measures to be taken to raise these resources i.e. national income and wealth.

4. Science of dynamic growth and development. Although the fundamental economic problem of scarcity in relation to needs is undisputed it would not be proper to think that economic resources - physical, human, financial are fixed and cannot be increased by human ingenuity, exploration, exploitation and development. A modern and somewhat modified definition is as follows:

"Economics is the study of how men and society choose, with or without the use of money, to employ scarce productive resources which could have alternative uses, to

produce various commodities over time and distribute them for consumption now and in the future amongst various people and groups of society". **Paul A. Samuelson**

The above definition is very comprehensive because it does not restrict to material well-being or money measure as a limiting factor. But it considers economic growth over time.

1.3 NATURE OF ECONOMICS

Under this, we generally discuss whether Economics is science or art or both and if it is a science whether it is a positive science or a normative science or both.

Economics - As a science and as an art:

Often a question arises - whether Economics is a science or an art or both.

(a) Economics is a science: A subject is considered science if

It is a systematised body of knowledge which studies the relationship between cause and effect.

It is capable of measurement.

It has its own methodological apparatus.

It should have the ability to forecast.

If we analyse Economics, we find that it has all the features of science. Like science it studies cause and effect relationship between economic phenomena. To understand, let us take the law of demand. It explains the cause and effect relationship between price and demand for a commodity. It says, given other things constant, as price rises, the demand for a commodity falls and vice versa. Here the cause is price and the effect is fall in quantity demanded. Similarly like science it is capable of being measured, the measurement is in terms of money. It has its own methodology of study (induction and deduction) and it forecasts the future market condition with the help of various statistical and non-statistical tools.

But it is to be noted that Economics is not a perfect science. This is because Economists do not have uniform opinion about a particular event.

The subject matter of Economics is the economic behaviour of man which is highly unpredictable.

Money which is used to measure outcomes in Economics is itself a dependent variable.

It is not possible to make correct predictions about the behaviour of economic variables.

(b) Economics is an art: Art is nothing but practice of knowledge. Whereas science teaches us to know art teaches us to do. Unlike science which is theoretical, art is practical. If we analyse Economics, we find that it has the features of an art also. Its various branches, consumption, production, public finance, etc. provide practical solutions to various economic problems. It helps in solving various economic problems which we face in our day-to-day life.

Thus, Economics is both a science and an art. It is science in its methodology and art in its application. Study of unemployment problem is science but framing suitable policies for reducing the extent of unemployment is an art.

Economics as Positive Science and Economics as Normative Science

(i) Positive Science: As stated above, Economics is a science. But the question arises whether it is a positive science or a normative science. A positive or pure science analyses cause and effect relationship between variables but it does not pass value judgment. In other words, it states what is and not what ought to be. Professor Robbins emphasised the positive aspects of science but Marshall and Pigou have considered the ethical aspects of science which obviously are normative.

According to Robbins, Economics is concerned only with the study of the economic decisions of individuals and the society as positive facts but not with the ethics of these decisions. Economics should be neutral between ends. It is not for economists to pass value judgments and make pronouncements on the goodness or otherwise of human decisions. An individual with a limited amount of money may use it for buying liquor and not milk, but that is entirely his business. A community may use its limited resources for making guns rather than butter, but it is no concern of the economists to condemn or appreciate this policy. Economics only studies facts and makes generalizations from them. It is a pure and positive science, which excludes from its scope the normative aspect of human behaviour.

Complete neutrality between ends is, however, neither feasible nor desirable. It is because in many matters the economist has to suggest measures for achieving certain socially desirable ends. For example, when he suggests the adoption of certain policies for increasing employment and raising the rates of wages, he is making value judgments; or that the exploitation of labour and the state of unemployment are bad and steps should be taken to remove them. Similarly, when he states that the limited resources of the economy should not be used in the way they are being used and should be used in a different way; that the choice between ends is wrong and should be altered, etc. he is making value judgments.

(ii) Normative Science: As normative science, Economics involves value judgments. It is prescriptive in nature and described 'what should be the things'. For example, the questions like what should be the level of national income, what should be the wage rate, how the fruits of national product be distributed among people - all fall within the scope of normative science. Thus, normative economics is concerned with welfare propositions. Some economists are of the view that value judgments by different individuals will be different and thus for deriving laws or theories, it should not be used.

1.4 LET US SUM UP

We have studied the different definitions of economics given by noted economists of different time period. Also we discussed the nature of economics and concluded that economics is both a science and art.

8

1.5 LESSON -END ACTIVITIES

    1. Define Economics

    2. Is Economics a Science or an art?

    3. Write a note on (a) Marshall's View of Economics (b) Adamsmiths view of Economics.

1.6 REFERENCES

1. Haynes, W.W., Managerial Economics, analysis and Cases Business Publications Inc., Texas.

2. Sankaran, Business Economics.

3. Sen, K.K. "An Introduction to Economics", Sultan Chand & Sons.

Lesson: 2- ECONOMIC ANALYSIS

CONTENTS

2.0 Aims and Objectives

2.1 Introduction

2.2 Nature of Economic Laws

2.3 Methods of Economic Analysis

      2.3.1 Deduction

      2.3.2 Induction

2.4 Micro-Economic Analysis

2.5 Macro-Economic Analysis

2.6 Let Us Sum Up

2.7 Lesson-End Activities

2.8 References

2.0 AIMS AND OBJECTIVES

After having studied this unit, you should be able

- To Understand the nature of Economic Laws
- To Know the methods of Economic Laws
- To Study the Micro and Macro approach

2.1 INTRODUCTION

Economic analysis is concerned with how an economy works, the formulation of economic laws, the methods of economic enquiry and the different approaches to economics.

Economic laws, unlike the exact laws of physical sciences, are more exact than laws of other social sciences. The two methods of economic enquiry namely deduction and induction play a vital part in economic reasoning. The two branches of economic analysis, viz. 1) Micro-economics and 2) Macro-economics are two different approaches, the one

10

analysing small individual units of the economy microscopically, whereas the other looks at the economy as a whole and its large aggregates respectively. Each has its advocates, but now every economics student recognizes the importance and complementarity of both.

2.2 NATURE OF ECONOMIC LAWS

Every science, natural or social, has its laws. These laws are generalizations built upon the bases of facts, reasoning and scientific verification. In economic science also, there are many such laws. But, by their nature, economic laws are different from those of physical sciences like Physics and Chemistry.

First of all, economic laws are hypothetical; they are valid with the qualifying phrase "ceteris paribus' which means "other things being equal". This condition qualifies all economic laws. In actual life, other things seldom remain equal. But this does not deter the validity of economic laws. All social sciences are under the necessity to make certain assumptions. To quote Alfred Marshall, "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". The implication of this definition is that given certain conditions, certain results are likely to occur. There is an element of uncertainty about them. For instance, the Law of Demand states that, if price rises, the demand for the commodity will contract. This is true and the law is quite valid, only when counteracting forces do not operate. Hence we say that economic laws are merely statements of tendencies. The hypothetical nature of economic laws in contrast to laws of natural sciences is due to the following reasons:

1. Economic laws are concerned with human behavior which is subject to emotions, impulses and feelings.

2. Time factor also makes for the hypothetical nature of economic laws.

With the passage of time, conditions change, and so also economic laws. However, economic laws are more exact than other social laws, because economic science makes use of the "measuring rod of money". To Marshall, the laws of economics are to be compared with the laws of tides rather than with the simple and exact law of gravitation. Economic laws, like tides, lack predictability and exactness.

11

Lionel Robbins, however, did not subscribe to this narrow view and broadened the scope of economic laws. Whether any objective or conduct of man is concerned with money or not is immaterial; still, it will fall within the ambit of economic laws, if it is involving the problem of choice, i.e., allocation of limited means among competing ends. In the view of Lionel Robbins, economic laws are statements of tendencies which govern human behavior relating to the use of scarce means for the achievement of unlimited wants.

Economic laws are not permanent, general and everlasting because they are framed in a particular social and institutional set-up. When the set-up itself changes, no longer the established law will remain relevant. Economic laws will undergo change with the evolution of economic life of man and transformation in the institutional set-up. Thus, economic laws applying to hunting and pastoral stages did not make sense in the agricultural and industrial stages. Economic laws framed in the context of capitalistic institutional set-up may not apply to the socialist countries. Laws of economics, valid for developed economies, may fail to apply to less developed countries because different conditions and factors obtain in these countries. Economic laws are not statutory commands or moral laws or even customary laws. They are merely in the indicative mood and not in the imperative mood.

2.3 METHODS OF ECONOMIC ANALYSIS

As in the case of every other science, so in the field of economic analysis, there are two important methods useful for investigation and formulation of its principles, laws, generalizations or theorems. They are 1. The deductive method and 2.The inductive method. The issue of whether deductive method is preferable to inductive method or vice versa was a raging controversy in the 19th century. The English classical economists like David Ricardo, T.R.Malthus, John Stuart Mill and Nassau Senior were solid advocates of deductive methodology.

12

2.3.1. Deduction

The deductive method is also called the abstract, analytical or a priori method. In this method, we start from a few indispensable facts and after making certain assumptions, through logical reasoning, certain conclusions are reached. It consists of three important stages, namely (i) observation, (ii) logical reasoning, and (iii) inference and testing by means of further observations. Deductive reasoning provides us with hypothesis which are tested and verified with relevance to facts and figures and then we draw valid economic laws.

In economics we start with simple premises and step by step work up to more complex and refined hypothesis. In this method, we descend from the general to the particular.

The following merits are found in the deductive method:

1. It is simple and logical.
2. It does away with the need for experimentation.
3. It leads to accuracy in generalisation due to logical reasoning.

However, there are certain defects:

1. If assumptions made are wrong, generalizations made on the basis of wrong assumptions will also be invalidated.
2. There is too much abstraction and economists through their intellectual exercise give rise to only "intellectual toys" without any reality.
3. Generalizations of deduction based on wrong premises may become dangerous and disastrous results will follow when governments frame policies on such premises.

2.3.2 Induction Method

The inductive method is also known as the empirical method. It derives economic generalizations based on experience and observations. In this, data are collected with reference to certain economic phenomena and finally generalizations are derived from the collected data and observations. Here we mount from the particular to the general. From

13

observations we build up through reasoning founded on experience, to formulate generalizations based on observed data. The historical school of Germany represented by Carl Knies, Hildebrand, Prof. Roscher and Von Thunen were strong and staunch supporters of the inductive method. It should, however, be emphasized that the division of opinion between the two schools of thought was neither complete nor clear-cut.

In the inductive method, economic scientists proceed from a particular angle to scientific problems to bridge the gap between theory and practice. Induction is done by either experimentation or the statistical approach and these are the two forms of induction. Experimentation has larger scope in the physical sciences and the statistical approach in social sciences like economics. The famous Malthusian Theory of Population and Engel's Law of Consumption are based on the statistical approach.

The merits of the inductive method are as follows:

1. It leads to precise, measurable conclusions.
2. It is highly practical and realistic.
3. It is helpful in verifying the conclusions of the deductive method.
4. It emphasises relativity of economic laws which are valid only under certain conditions and circumstances.

The following are the drawbacks of the inductive method:

1. There is an underlying risk of drawing false and hurried conclusions from inadequate data and facts.
2. The collection of data and facts in itself is no easy work.
3. Divorced from deduction which uses logical analysis, it would only produce a mass of unrelated and unconnected facts and figures. Induction alone would not deliver the goods unless it is supplemented by using deductive reasoning.

2.4 MICRO-ECONOMIC ANALYSIS

The subject matter of economics consists of two parts, namely Micro economics and Macro economics. Ragnar Frisch. Who is among the first Nobel laureates in Economics coined these term. Which are now universally used. "Micro" is derived from the Greek word "Mikros" meaning small and "Macro" from "Makros" meaning large.

In Micro–Economics we study the economic behaviour of an individual, firm or industry in the national economy. It is thus a study of a particular unit rather than all the units combined. We mainly study the following in Micro-Economics:

(i) Product pricing;

(ii) Consumer behaviour

iii) Factor pricing;

iv) Economic conditions of a section of the people;

(v) Study of firms; and

(vi) Location of a industry.

According to K.E. Boulding, "Micro economics is the study of particular firms, particular households, individual prices, wages, incomes, individual industries, particular commodities". Thus, it deals with the analysis of small individual units of the economy such as individual consumers, firms and small groups of individual units such as various industries and markets; it is a microscopic study of the economy. Herein it should be emphasized that it does not study the economy in its totality. It looks at the economy through a microscope, to analyse how the millions of units in the economy (analogous to cells in any organism) play their part in the functioning of the entire economic organisation. To quote Prof.Mc.Connel, "Micro Economics is concerned with specific economic units and a detailed consideration of the behavior of these individual units. In Micro Economics, we examine the trees, not the forest. Micro Economics is useful in achieving a worm's-eye view of some very specific component of our economic system''

2.5 MACRO ECONOMIC ANALYSIS

Macroeconomics is the study of aggregates; hence called Aggregative Economics. It is the analysis of the entire economic system, the overall conditions of an economy like total investment and total production. In the words of K.E.Boulding, "Macroeconomics deals not with individual quantities as such but with aggregates of these quantities; not with individual incomes, but with the national income; not with individual prices but with the price levels; not with individual outputs but with the national output." It analyses the

entire economy and its large aggregates like total national income and output, aggregate consumption, saving and investment and total employment.

In Macro-Economics, we study the economic behaviour of the large aggregates such as the overall conditions of the economy such as total production, total consumption, total saving and total investment in it. It is the study of overall economic phenomena as a whole rather than its individual parts. It includes:

(i)   National income and output;

(ii) General price level;

(iii) Balance of trade and payments;

(iv) External value of money;

(v)   Saving and investment; and

(vi) Employment and economic growth.

Thus, when we study why we continue to have balance of payments deficits, or why the value of rupee vis-a-vis dollar is falling or why saving rates are high or low in a particular country we are studying Macro-Economics.

In the view of Prof. Mc. Connel, " The level of Macroeconomics is concerned either with the economy as a whole or with the basic sub-divisions or aggregates such as governments, households and businesses which make up the economy In short, macroeconomics examines the forest, not the trees. It gives us a bird's-eye view of the economy". It deals with the great averages and aggregates of the system rather than with particular units composing it.

2.6 LET US SUM UP

In this lesson we discussed in detail the nature and methods of economic analysis. We also studied Micro and Macro economic analysis.

2.6 LESSON –END ACTIVITIES

1. What do you mean by deductive method?

2. What is an inductive method?

3. What is Macro Economic analysis and how it differs from Micro economic analysis?

2.7 REFERENCES

1. Mote, Paul Gupta, Managerial Economics, Tata McGraw Hill.

2. Adhikary,m M. Managerial Economics, Khosla Publishers.

3. Joel Dean, Managerial Economics, Asia Publishing House.

4. Sen, K.K. "An Introduction to Economics", Sultan Chand & Sons.

5. Sudharsan & Sudhman, Business Economics.

Lesson: 3 BUSINESS ECONOMICS

CONTENTS

3.0 Aims and Objectives

3.1 Introduction

3.2 Definition of Business Economics

3.3 Characteristics of Business Economics

3.4 Objective of Business Economics

3.5 Scope of Managerial or Business Economics

3.6 Fundamental concepts of Applied Managerial Economics

3.7 Let Us Sum Up

3.8 Lesson-End Activities

3.9 References

3.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- **To Know the definition and characteristics of Business Economics**
- **To understand the goal of Business Economics**
- **To widely appreciate the scope of Business Economics**

3.1 INTRODUCTION

Managerial Economics consists of that part of economic theory which helps the business manager to take rational decisions. Economic theories help to analyse the practical problems faced by a business firm. Managerial Economics integrates economic theory with business practice. It is a special branch of economics that bridges the gap between abstract theory and business practice. It deals with the use of economic concepts and principles for decision making in a business unit It is over wise called Business Economics or Economics of the Firm. The terms Managerial Economics and Business

Economics are used interchangably. The term Managerial Economics is more in use now-a-days. Managerial Economics is economics applied in business decision-making. Hence it is also called Applied Economics.

3.2 Definition of Business Economics

In simple words, business economics is the discipline which helps a business manager in decision making for acheiving the desired results. In other words, it deals with the application of economic theory to business management.

According to **Spencer and Siegelman**, Business economics is "the integration of economic theory with business practise for the purpose of facilitating decision-making and forward planning by management".

According to Mc **Nair and Meriam**, "Business economics deals with the use of economic modes of thought to analyse business situation".

From the above said definitions, we can safely say that business economics makes in depth study of the following objectives:

ii) Explanation of nature and form of economic analysis

(ii) Identification of the business areas where economic analysis can be applied

(Hi) Spell out the relationship between Managerial Economics and other disciplines outline the methodology of managerial economics.

3.3 CHARACTERISTICS OF BUSINESS ECONOMICS

The following characteristics of business economics will indicate its nature:

1. Micro economics: Managerial economics :s micro economic in character. This is so because it studies the problems of an individual business unit. It does not study the problems of the entire economy.

2. Normative science: Managerial economics is a normative science. It is concerned with what management should do under particular circumstances. It determines the goals of the enterprise. Then it develops the ways to achieve these goals.

3. Pragmatic: Managerial economics is pragmatic. It concentrates on making economic theory more application oriented. It tries to solve the managerial problems in their day-to-day functioning.

19

4. Prescriptive: Managerial economics is prescriptive rather than descriptive. It prescribes solutions to various business problems.

5. Uses macro economics: Marco economics is also useful to business economics. Macro-economics provides an intelligent understanding of the environment in which the business operates. Managerial economics takes the help of macro-economics to understand the external conditions such as business cycle, national income, economic policies of Government etc.

6. Uses theory of firm: Managerial economics largely uses the body of economic concepts and principles towards solving the business problems. Managerial economics is a special branch of economics to bridge the gap between economic theory and managerial practice.

7. Management oriented: The main aim of managerial economics is to help the management in taking correct decisions and preparing plans and policies for future. Managerial economics analyses the problems and give solutions just as doctor tries to give relief to the patient.

8. Multi disciplinary: Managerial economics makes use of most modern tools of mathematics, statistics and operation research. In decision making and planning principles such accounting, finance, marketing, production and personnel etc.

9. Art and science.-Managerial economics is both a science and an art. As a science, it establishes relationship between cause and effect by collecting, classifying and analyzing the facts on the basis of certain principles. It points out to the objectives and also shows the way to attain the said objectives.

3.4 OBJECTIVES OF BUSINESS ECONOMICS

Managerial economics provides such tools necessary for business decisions. Managerial economics answers the five fundamental problems of decision making. These problem are : (a) what should be the product mix (b) which is the least cost production technique and input mix (c) what should be the level of output and price of the product (d) how to take investment decisions (e) how much should be the selling cost. In order to solve the problems of decision- making, data are to be collected and analysed in the light

20

of business objectives. Business economics supplies such data to the business economist. As pointed out by Joel Dean "The purpose of managerial economics is to show how economic analysis can be used in formulating business policies"

The basic objective of managerial economics is to analyse economic problems of business and suggest solutions and help the managers in decision-making. The objectives of business economics are outlined as below:

1. To integrate economic theory with business practice.
2. To apply economic concepts: and principles to solve business problems.
3. To employ the most modern instruments and tools to solve business problems.
4. To allocate the scarce resources in the optimal manner.
5. To make overall development of a firm.
6. To help achieve other objectives of a firm like attaining industry leadership, expansion of the market share etc.
7. To minimise risk and uncertainty
8. To help in demand and sales forecasting.
9. To help in operation of firm by helping in planning, organising, controlling etc.
10. To help in formulating business policies.
11. To help in profit maximisation.

Business economics is useful because: (i) It provides tools and techniques for managerial decisions, (ii) It gives answers to the basic problems of business management, (iii) It supplies data for analysis and forecasting, (iv) It provides tools for demand forecasting and profit planning, (v) It guides the managerial economist.   -

Thus, Business economics offers a number of benefits to business managers. It is also useful to individuals, society and government.

3.5 SCOPE OF MANAGERIAL OR BUSINESS ECONOMICS

Managerial economics is a developing science which generates the countless problems to determine its scope in a clear-cut way. From the following fields, we can examine the scope of business economics.

1. Demand analysis and forecasting. The foremost aspect regarding scope is demand analysis and forecasting. A business firm is an economic unit which transforms

21

productive resources into saleable goods. Since all output is meant to be sold, accurate estimates of demand help a firm in minimising its costs of production and storage. A firm must decide its total output before preparing its production schedule and deciding on the resources to be employed. Demand forecasts serves as a guide to the management for maintaining its market share in competition with its rivals, thereby securing its profit.

2. Cost and production analysis. A firm's profitability depends much on its costs of production. A wise manager would prepare cost estimates of a range of output, identify the factors causing variations in costs and choose the cost-minimising output level, taking also into consideration the degree of uncertainty in production and cost calculations. Production process are under the charge of engineers but the business manager works to carry out the production function analysis in order to avoid wastages of materials and time. Sound pricing policies depend much on cost control. The main topics discussed under cost and production analysis are: Cost concepts, cost-output relationships, Economies and Diseconomies of scale and cost control.

3. Pricing decisions, policies and practices. Another task before a business manager is the pricing of a product. Since a firm's income and profit depend mainly on the price decision, the pricing policies and all such decisions are to be taken after careful analysis of the nature of the market in which the firm operates. The important topics covered in this field of study are : Market Structure Analysis, Pricing Practices and Price Forecasting.

4. Profit management. Each and every business firms are tended for earning profit, it is profit which provides the chief measure of success of a firm in the long period. Economists tells us that profits are the reward for uncertainity bearing and risk taking. A successful business manager is one who can form more or less correct estimates of costs and revenues at different levels of output. The more successful a manager is in reducing uncertainity, the higher are the profits earned by him. It is therefore, profit-planning and profit measurement constitute the most challenging area of business economics.

5. Capital management. Still another most challenging problem for a modern business manager is of planning capital investment. Investments are made in the plant and machinery and buildings which are very high. Therefore, capital management requires

top- level decisions. It means capital management i.e., planning and control of capital expenditure. It deals with Cost of capital, Rate of Return and Selection of projects.

6. Inventory management: A firm should always keep an ideal quantity of stock. If the stock is too much, the capital is unnecessarily locked up in inventories At the same time if the level of inventory is low, production will be interrupted due to non-availability of materials. Hence, a firm always prefers to have an optimum quantity of stock. Therefore, managerial economics will use some methods such as ABC analysis, inventory models with a view to minimising the inventory cost.

7. Linear programming and theory of games : Linear programming and theory of games have came to be regarded as part of managerial economics recently.

8. Environmental issues: There are certain issues of macroeconomics which also form a part of managerial economics. These issues relate to general business, social and political environment in which a business enterprise operates.

9. Business cycles: Business cycles affect business decisions. They refer to regular fluctuations in economic activities in the country. The different phases of business cycle are depression, recovery, prosperity, boom and recession.

Thus, managerial economics comprises both micro and macro-economic theories. The subject matter of managerial economics consists of all those economic concepts, theories and tools of analysis which can be used to analyse the business environment and to find out solution to practical business problems.

3.6 FUNDAMENTAL CONCEPTS OF APPLIED MANAGERIAL ECONOMICS

Decision making is the core of Managerial Economics. Some fundamental concepts and techniques help the management to take correct decisions. The following are the six fundamental concepts used in Managerial Economics:

1. Principle of opportunity cost: Every scarce goods or activity has an opportunity cost. Opportunity cost of anything is the cost of the next best alternative which is given up. It refers to the cost of foregoing or giving up an opportunity. It is the earnings that would be realised if the available resources were put to some other use. It implies the income or benefit foregone because a certain course of action has been taken. Thus opportunity costs are measured by the sacrifices made in the decision. If there is no sacrifice involved

23

by a decision there will be no opportunity cost. It is also called alternative cost or transfer cost.

The opportunity cost of using a machine to produce one product is the income forgone which would have been earned from the production of other products. If the machine has only one use, it has no opportunity cost. Similarly, the opportunity costs of funds invested in one's own business is the amount of interest earned if the amount had been used in other projects. If an old building is proposed to be used for a business, likely rent of the building is the opportunity cost. These are called opportunity costs because they represent the opportunities which are foregone.

Devenport, an American Economist explains the concept of opportunity cost with reference to an example. Suppose a girl had two kinds of fruits- one pear and one peach, and if a bad boy is after her to seize the fruits, then the best way for the girl is to drop one fruit and run with the other, so that, she can at least save one fruit, at the cost of the other. When the girl so drops by the way - side one fruit and runs with the other, then the opportunity cost of the fruit she saves is the foregone alternative of the fruit she lost. This is the opportunity cost theory.

The concept of opportunity cost plays an important role in managerial decisions. This concept helps in selecting the best possible alternative from among various alternatives available to solve a particular problem. This concept helps in the best allocation of available resources.

2. Principle of incremental cost and revenue: Two important incremental concepts used in Managerial Economics are fundamental concepts of Managerial Economics are incremental cost and incremental revenue. Incremental cost is a change in total cost resulting from a decision. Incremental revenue means the change in total revenue resulting from a decision. A decision is profitable only if

(i)   It increases revenue more than costs,

(ii)   It decreases some costs more than it increases others,

(iii)   It increases some revenue more than it decreases others, and

(iv)   It reduces costs more than revenue.

24

Incremental principle can be used in the theories of consumption, production, pricing and distribution. Incremental concept is closely related to marginal cost and marginal revenue in the theory of pricing.

3. Principle of Time Perspective. Another principle is the principle of time perspective which is useful in decision-making in output, prices, advertising and expansion of business. Economists distinguish between the short run and the long run in discussing the determination of price in a given market form because in the long run a firm must cover its full cost. On the contrary, in the short-run it can afford to ignore some of its (fixed) costs. Modern economists have started making use of an "intermediate run" between the short run and the long run in order to explain pricing and output behaviour under what is called oligopoly. The principle of time perspective can be stated as under : A decision should take into account both the short run and the long run effects on revenues and costs and maintain a right balance between the long run and the short run perspectives.

4. Discounting Principle. Generally people consider a rupee tomorrow to be worth less than a rupee today. This is also implied by the common saying that a bird in hand is worth than two in the bush. Anybody will prefer Rs. 1000 today to Rs. 1000 next year. There are two main reasons for this : (1) the future is uncertain and it is preferable to get Rs. 1000 today rather than a year after ; (2) even if one is sure to receive the Rs. 1000 next year, one would do well to receive Rs. 1000 now and invest it for a year and earn a rate of interest on Rs. 100 for one year.

What is the present worth (PW) of Rs. 1000 obtainable after one year ? The relevant formula for finding this out is

$PW = \dfrac{Rs.100}{1+i}$ where i is the rate of interest.

We find that PW of Rs. 100 $= 100 \div (1 + 8\%)$

$$= 100 \div 108 = Rs. 92.59.$$

The same reasoning applies to longer periods. A sum of Rs. 100 two years after will have a present worth :

$PW = \dfrac{Rs.100}{(1+i)^2} = \dfrac{Rs.100}{(1.08)^2} = \dfrac{Rs.100}{1.1664} = Rs. 85.73$

25

The principle of economics used in the calculations given above is called the discounting principle. It can be explained as "If a decision affects costs and revenues at future dates, it is necessary to discount those costs and revenues to obtain the present values of both before a valid comparison of alternatives can be made"present values of both before a comparison of alternatives can be made''

5. Equi-marginal principle : This is one of the widely used concepts in managerial economics. This principle is also known the principle of maximum satisfaction. According to this principle, an input should be allocated in such a manner that the value added by the last unit of input is same in all uses. In this way, this principle provides a base for maximum exploitation of all the inputs of a firm so as to maximise the profitability.

The equi-marginal principle can be applied in different areas of management. It is used in budgeting. The objective is to allocate resources where hey are most productive. It can be used for eliminating waste in useless activities. It can be applied in any discussion of budgeting. The management can accept investments with high rates of return so as to ensure optimum allocation of capital resources. The equi-marginal principle can also be applied in multiple product pricing. A multi product firm will reach equilibrium when the marginal revenue obtained from a product is equal to that of another product or products. The equi-marginal principle may also be applied in allocating research expenditures.

6.   Optimisation : This is another important concept used managerial economics. Managerial economics often aims at optimising a given objective. The objective may be maximisation of profit or minimisation of time or minimisation of cost. The important techniques for optimisation include marginal analysis, calculus, linear programming etc.

3.7 LET US SUM UP

This Lesson discusses in detail business economics, its characteristics, objectives and scope. Fundamental concepts of economics that help the management to take correct decisions are also dealt with.

3.8 LESSON-END ACTIVITIES

     1. Define Business Economic

     2. State the important characteristics of Business Economics

     3. Write short notes on

     (a)Opportunity Cost (b) Discounting Principle (c) Equi-Marginal Principle

3.9 REFERENCES

     1. Adhikary, M. Managerial Economics, Khosla Publishers.

     2. Joel Dean, Managerial Economics, Asia Publishing House.

     3. Sudharsan & Sudhman, Business Economics.

<div align="center">

Lesson:4 – BUSINESS ECONOMIST

</div>

CONTENTS

4.0 Aims and Objectives

4.1 Introduction

4.2 Role of Managerial Economist

4.3 Responsibilities of a Business Economist

4.4 Let Us Sum Up

4.5 Lesson-End Activities

4.6 References

4.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To acquire Knowledge on the Role of a Business Economist
- To familiarize the Responsibilities that a Business Economist should possess

4.1 INTRODUCTION

A managerial economist plays a vital role in modern business. He helps the management of a firm in decision making and forward planning by using his skills and techniques. In advanced countries like U.S.A., U.K. and Canada, almost all big firms employ managerial economists. In leading business firms are employing business economists. Tatas, Hindustan Lever and Reliance have managerial economists on their staff. The role of a managerial economist is that of a business analyst and of an advisor. It is a part and parcel of modern business activities. Accordingly, his responsibilities are also heavy. Let us explain his role any responsibilities in detail.

4.2. ROLE OF A MANAGERIAL ECONOMIST

1. Study of the business environment. Every firm has to take into consideration such external factors as the growth of national income, volume of trade and the general price trends, for its policy decision. A firm works within a business environment. The basic element of business environment for a firm are the trend of growth of national economy

and world economy and phase of the business cycle in which the economy is moving. At what rate and where is population getting concentrated? Where are the demand prospects for established and new products? Where are the prospective markets? These questions lead the economists into purposeful studies of the economic environment.

The international economic outlook is a very important environmental factor for exporting firms. The nature and degree of competition within the industry in which a firm is placed are also a part of the business environment.

The kind of economic policies pursued by the government constitute a powerful element of the business environment of a firm. What are the priorities of the new five year plain? In which sectors of the economy have the outlays been bran increased? What are the budgetary trends? What about changes in expenditure, tax rates tariffs and import restrictions? For all purposes the economists place a significant role.

2. Business Plan and Forecasting. The business economists can help the management in the formation of their business plan by forecasting and economic environment. The management can easily decide the timing and locating of their specific action. The managerial economists has to interpret the national economic trends and industrial outlook for their relevance to the firm in which he is working. He advises top management by means of short, business like practical notes. In a partially controlled economy like India, the business economists translates the government's intentions in business jargon and also transmits the reaction of the industry to propose changes in government policy.

3. Study of business operations. The business economist can also help the management in decision making relating to the internal operations of a firm, i.e., in deciding about price, rate of operations, investment and growth of the firm for offering this advice ; the economist has specific analytical and forecasting techniques which yield meaningful conclusions. What will be the reasonable sales and profit budget for the next year? What are the suitable production schedules and inventory policies? What changes in wage and price policies are imperative now? What would be the sources of finance? Thus, he is trained to answer such questions posted by the top management.

4 Economic intelligence. The business economist also provides general intelligence services by supplying the management with economic information of general interest so that they can talk intelligently in conferences and seminars. They are also supplied the facts and figures for preparing the annual reports of the firm. Those facts and figures are collected by the business economist as he understands the literature available on business activities.

5 Specific functions. Business economists are now performing specific functions as consultants also. Their specific functions are demand forecasting, industrial market research, pricing problems of industry, production programmes, investment analysis and forecasts. They also offer advice on trade and public relations, primary commodities and foreign to capital projects in agriculture, industry, transport and tourism and also of the export environment.

6. Participation in Public Debates. The business economists participate in public debates organised by different agencies. Both governments and society seek their advice. Their practical experience in business and industry gives value to their observation.

In nut shell a business economist can play a multi-faceted role. He is not only an analyst of current trends and policies for his employers but also a bridge between the businessmen in the specific industry and the Govt.

4.3 RESPONSIBILITIES OF A BUSINESS ECONOMIST

A business economist is well familiar with his responsibilities. He must keep in the mind the main objective of making a reasonable profit on the invested capital in his firm. Firms are not always after profit-maximization, but to continue in business, every firm has to operate for profit. Therefore, a business economist has the main responsibility of helping the management to make more profits than before. All his other responsibilities flow from this basic obligation. The responsibilities of a business economists are summarised below :

1. Making successful Forecasts. Managements have to take decisions concerning the future and it is uncertain. This uncertainity cannot be eliminated altogether but it can be reduced through scientific forecasts of the economic environment to his employers. This is required for business planning. If a business economist can make successful forecasts

about business trends, the management will hold him in great esteem. A wise managerial economist will revise his forecasts from time to time keeping in view new developments in his business. As soon as he finds a change in his forecasts, he has to alert the management about it. He assists the management in making the needed adjustments. This will help him to strengthen his position as a member of the managerial team.

2. Maintaining Relationships. The managerial economists must establish and maintain contacts with data sources for his analysis and forecasts. He makes contacts with individual who are specialists in the different fields. He must join professional associations and subscribe to the journals giving him fresh and latest information. In other words, his business biggest quality is his ability to obtain information quickly by establishing contacts with the sources of such information.

3. Earning full Status on the Managerial team. A business economist has to participate in decision-making and forward- planning. For this he must be able to earn full status on the business team. He must be prepared to take up assignments on special project also. He should be able to express himself clearly so that his advice is understood and accepted. Finally, he must be in tune with the industry's thinking, and not lose the national perspective in giving advice to the management.

Thus, we can conclude from our discussion that managerial economists can earn an important place in the managerial team only if the understands and undertakes his responsibilities.

4.4 LET US SUM UP

The Role and Responsibilities of a managerial economist are dealt with in detail in this lesson.

4.5 LESSON -END ACTIVITIES

1. Briefly discuss the different roles of a managerial economist.

2. What are the responsibilities of a business economist?

4.6 REFERENCES

1. Mote, Paul Gupta, Managerial Economics, Tata McGraw Hill.

2. Peterson Lewis, Managerial Economics, Prentice Hall of India.

3. Evan J. Doughlas: Managerial Economics, Theory, Practice and Problems, Prentice Hall, Inc.

Lesson: 5- MANAGERIAL ECONOMICS AND OTHER SCIENCES

CONTENTS

5.0 Aims and Objectives

5.1 Introduction

5.2 Managerial Economics and Statistics

5.3 Managerial Economics and Mathematics

5.4 Managerial Economics and Operations Research

5.5 Managerial Economics and Accounting

5.6 Let Us Sum Up

5.7 Lesson-End Activities

5.8 References

5.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To know the relationship of Managerial Economics with various other fields of study.

5.1 INTRODUCTION

To broadly appreciate the nature and scope of managerial economics it is necessary to examine its relationship with other sciences. At this juncture it is apt to specially mention the relationship of managerial economics with the important fields of study such as statistics, mathematics, operations research, and accounting.

5.2 MANAGERIAL ECONOMICS AND STATISTICS

Statistics provides several tools to Managerial Economics; Statistical techniques are used in collecting, marshalling and analysing business data that makes possible an empirical testing of the economic generalisations before they are applied for decision

33

making. Economic generalisations cannot be fully accepted until they are verified and found Valid against the real data. The theory of probability and forecasting techniques help the manager in decision-making process. When the manager is to meet with the reality of uncertainty in decision making the theory of probability provides the logic for dealing with such uncertainty.

5.3 MANAGERIAL ECONOMICS AND MATHEMATICS

Mathematics is especially of to the manager when several economic relationships are to logic in the analysis of economic events provides clarity of the concepts and also helps to establish a quantitative relationship. Managers deal primarily with concepts that are quantitative in nature eg., demand, price, cost, capital, wages, inventories etc. Mathematics is the manager's most useful logical tool.

5.4 MANAGERIAL ECONOMICS AND OPERATIONS RESEARCH

Operation research and managerial economics are related to a certain extent. Operation research is the application of mathematical and statistical techniques in solving business problems. It deals with construction of mathematical models that helps the decision making process. Operation research is helpful in business firms in studying the inter-relationship and relative efficiencies of various business aspects like sales, production etc. Linear programming, techniques of inventory control, game theory etc. are used in managerial economics. These are used to find out the optimum combination of various factors to achieve the objects of maximisation of profit, minimizations of cost and time etc.

5.5 MANAGERIAL ECONOMICS AND ACCOUNTING

Accounting is closely related with managerial economics. Accounting is the main source of data regarding the operation and functioning of the firm. Accounting data and statements represent the language of the business. A business manager needs market information, production information and accounting information for decision-making. The profit and loss statement reflects the operational efficiency of the firm.

34

The balance sheet tells the financial position of the firm. The accounting information provides a basis for the manager in decision making and forward planning. In short, accounting provides right information to take right decisions.

5.6 LET US SUM UP

Business Economics helps the manager of an organization to take rationale decision by implementing its concepts, principles and methods. It helps to achieve the organizational objective in an efficient manner. It is interconnected with other fields of study.

5.7 LESSON-END ACTIVITIES

1. Discuss the relationship of Business Economics with other fields of study.

5.8 REFERENCES

1. Haynes, W.W., Managerial Economics, Analysis and Cases, Business Publications, Inc., Texas.

2. Adhikary, M. Managerial Economics, Khosla Publishers.

3. Evan J. Douglas: Managerial Economics Theory, Practice and Problems, Prentice Hall Inc.

UNIT –II

DEMAND ANALYSIS

Lesson: 6 – DEMAND

CONTENTS

6.0 Aims and Objectives

6.1 Introduction

6.2 Meaning of Demand

6.3 Determinants of Demand

6.4 Let us Sum Up

6.5 Lesson-End Activities

6.0 AIMS AND OBJECTIVES

After having studied this unit, you should be able

- To understand the concept of demand
- To identify the determinants of the demand for a commodity

6.1 INTRODUCTION

This lesson examines demand and its determinants. Demand is the force that drives all business without a demand for its goods or services, a firm is doomed to failure.

6.2 MEANING OF DEMAND

In economic science, the term "demand" refers to the desire, backed by the necessary ability to pay. The demand for a good at a given price is the quantity of it that can be bought per unit of time at the price. There are three important things about the demand: 1. It is the quantity desired at a given price. 2. It is the demand at a price during a given time. 3. It is the quantity demanded per unit of time.

6.3 DETERMINANTS OF DEMAND

The factors that determine the size and amount of demand are manifold. The term "function" is employed to show such "determined" and "determinant" relationship. For instance, we say that the quantity of a good demanded is a function of its price

36

i.e., $Q = f(p)$

Where Q represents quantity demanded

f means function, and

p represents price of the good.

There are many **important determinants** of the demand for a commodity:

1. Price of the goods: The first and foremost determinant of the demand for good is price. Usually, higher the price of goods, lesser will be the quantity demanded of them.

2. Income of the buyer: The size of income of the buyers also influences the demand for a commodity. Mostly it is true that "larger the income, more will be the quantity demanded".

3. Prices of Related Goods: The prices of related goods also affect the demand for a good. In some cases, the demand for a good will go up as the price of related good rises. The goods so inter-related arc known as substitutes, e.g. radio and gramophone. In some other cases, demand for a good will comes down as the price of related good rises. The goods so inter-related are complements, e.g. car and petrol, pen and ink, cart and horse, etc.

4. Tastes of the buyer: This is a subjective factor. A commodity may not be purchased by the consumer even though it is very cheap and useful, if the commodity is not up to his taste or liking. Contrarily, a good may be purchased by the buyer, even though it is very costly, if it is very much liked by him.

5. Seasons prevailing at the time of purchase; In winter, the demand for woollen clothes will rise; in summer, the demand for cool drinks rises substantially; in the rainy season, the demand for umbrellas goes up.

6. Fashion: When a new film becomes a success, the type of garments worn by the hero or the heroine or both becomes an article of fashion and the demand goes up for such garments.

7. Advertisement and Sales promotion: Advertisement in newspapers and magazines, on outdoor hoardings on buses and trains and in radio and television broadcasts, etc. have a substantial effect on the demand for the good and thereby improves sales.

The need to have clarity in demand analysis makes us adopt a 'ceteris paribus' assumption, i.e. all other things remain the same except one. This enables us to consider the relation between demand and each of the variable factors considered in isolation.

6.4 LET US SUM UP

We have studied that the term demand refers to the quantities of goods that consumers are willing and able to purchase at various prices during a given period of time. Also we identified the various vital determinants of the demand for a commodity.

6.5 LESSON-END ACTIVITIES

1. Identify and discuss the various determinants of the demand for a commodity.

6.6 REFERENCES

1. Petersen, H. Craig and W. Cris Lewis, Managerial Economics,m Pearson Education Asia.

2. Sankaran, Business Economics.

3. Mote, V.L. Samuel Paul and G.S. Gupta "Managerial Economics.

Lesson: 7 LAW OF DEMAND

CONTENTS

7.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To understand the relation of price to sales
- To know about the reasons for the Law of Demand
- To sort out certain cases where the Law of demand does not hold good
- To Know the various types of demand
- To explain consumer's demand through indifference curve analysis

39

7.1 INTRODUCTION

For a long period of time economists are much interested to study the relationship of price and sales. An indepth knowledge of such relationship is necessary for the management

7.2 Law of Demand

Among the many causal factors affecting demand, price is the most significant and the price- quantity relationship called as the Law of Demand is stated as follows: "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" (Alfred Marshall). In simple words other things being equal, quantity demanded will be more at a lower price than at higher price. The law assumes that income, taste, fashion, prices of related goods, etc. remain the same in a given period. The law indicates the inverse relation between the price of a commodity and its quantity demanded in the market. However, it should be remembered that the law is only an indicative and not a quantitative statement. This means that it is not necessary that such variation in demand be proportionate to the change in price.

7.3 Demand Schedule

It is a list of alternative hypothetical prices and the quantities demanded of a good corresponding to these prices. It refers to the series of quantities an individual is ready to buy at different prices. An imaginary demand schedule of an individual for apples is given below:

Table 1. Demand of a Consumer for apples

Price of apple per unit (in rupees)	Quantity demanded of apples (in dozens)

5	1
4	2
3	3
2	4

Assuming the individual to be rational in his purchasing behaviour, the above schedule illustrates the law of demand. At Rs.5/- per apple, the consumer demands 1 dozen of apples; at Rs.4/- per unit 2 dozens, at Rs.3/- per unit 3 dozens and at Rs.2/~ per unit 4 dozens. Thus the inverse relationship between price and demand is shown in the demand schedule.

7.4 Demand Curve

When the data presented in the demand schedule can be plotted on a graph with quantities demanded on the horizontal or X- axis and hypothetical prices on the vertical or Y- axis, and a smooth curve is hypothetical prices on the vertical or Y- axis, and a smooth curve is drawn Joining all the points so plotted, it gives a demand curve. Thus, the demand schedule is translated into a diagram known as the demand curve.
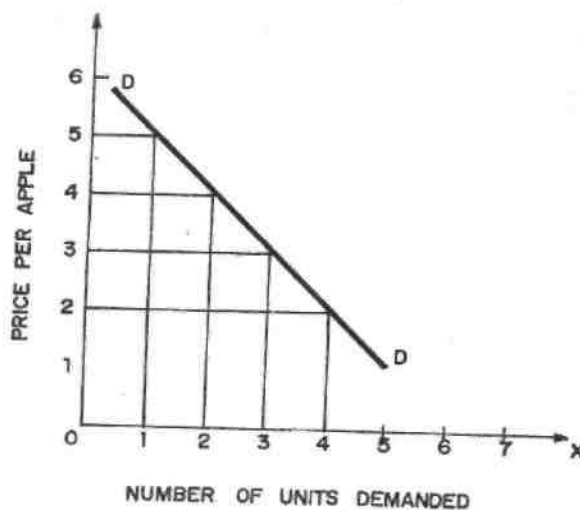
Fig -1

The demand curve slopes downwards from left to right, showing the inverse relationship between price and quantity as in Figure 1.

7.5 Market Demand

41

The market demand reflects the total quantity purchased by all consumers at alternative hypothetical prices. It is the sum-total of all individual demands. It is derived by adding the quantities demanded by each consumer for the product in the market at a particular price. The table presenting the series of quantities demanded of all consumers for a product in the market at alternative hypothetical prices is known as the Market Demand Schedule. If the data are represented on a two dimensional graph, the resulting curve will be the Market Demand Curve. From the point of view of the seller of the product, the market demand curve shows the various quantities that he can sell at different prices. Since the demand curve of an individual is downward sloping, the lateral addition of such curves to get market demand curve will also result in downward sloping curve.

7.6 Shifts in Demand Curve

The price-quantity relationship represented by the law of demand is important but it is more important for the manager of the firm to know about the shifts in the demand function (or curve). For many products, change in price has little effect in the quantity demanded in relevant price ranges. Many other determinants like incomes, tastes, fashion, and business activity have larger effect on demand for such product. Thus, changes or shifts in demand curve rather than movement along the demand curve is of greater significance to the decision-maker in the firm.

Let us clearly know the difference between movement along one and the same demand curve and shift in demand curve due to changes

Fig- 2a

42
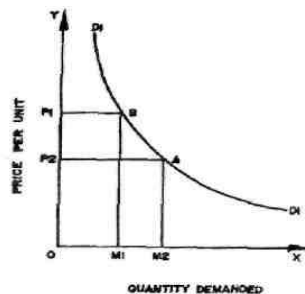
in demand. When price of a good alone varies, ceteris paribus, the quantity demanded of the good changes. These changes due to price variations alone are called as extension or contraction of demand represented by movement along the same demand curve. Such movement along the same demand curve is shown in Figure 2(a). Price declines from OP1 to OP2 and demand goes up from OM1 to OM2. Here the demand for the good is said to have extended or expanded. This is represented by movement from point A to point B along the demand curve. On the contrary, if price rises from OP2 to OP1 demand falls from OM2 to OM1. Here the demand for the good is said to have contracted. This is represented by movement from point B to point A along the demand curve D1D1.

Quantity Demanded
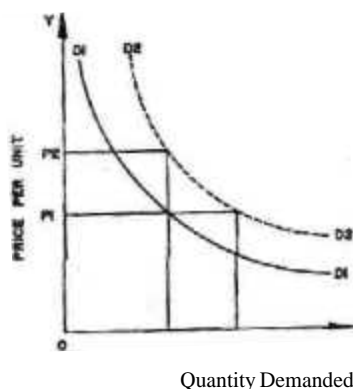
Fig. 2b

Shifts in demand curve take place on account of determinants other than price such as changes in income, fashion, tastes, etc. The ceteris paribus assumption is relaxed; other factors than price influence demand and the impact of these factors on demand is described as changes in demand or shifts in demand, showing increase or decrease in demand. This kind of change is shown in Figure 2(b). The quantity demanded at OP1 is OM1. If, as a result of increase in income, more of the product is demanded, say OM2 at the same price OP1. Note that OM2 is due to the new demand curve D2D2. This is a case of shift in demand. Due to fall in income, less of the good may be demanded at the same price and this will be a case of decrease in demand. Thus increase or decrease in demand with shifts in demand curves upward or downward are different from extension or contraction of demand.

43

Causes of changes in demand may be due to:

1. Changes in the consumer's income.
2. Changes in the tastes of the consumer.
3. Changes in the prices of related goods (substitutes and complements).
4. Changes in exogenous factors like fashion, social structure, etc.

7.7 WHY THE DEMAND CURVE SLOPES DOWNWARD OR REASONS FOR THE LAW OF DEMAND

Truly, the demand curve slopes left downward to right, throughout its length although the slope may be much steeper in some parts. It means, demand increases with the fall in price and contracts with an increase in price. There are several reasons responsible for the inverse price demand relationship which has been explained as under:

1. Law of Diminishing Marginal Utility. The law of demand is based on the law of diminishing marginal utility which states that as the consumer purchases more and more units of a commodity, the utility derived from each successive unit goes on decreasing. It means as the price of the commodity falls, consumer purchases more of the commodity so that his marginal utility from the commodity falls to be equal to the reduced price and vice-versa.

2. Substitution Effect. Substitution effect also leads the demand curve to slope from left downward to right. As the price of a commodity falls, prices of its substitute goods remain the same, the consumer will buy more of that commodity. For instance, tea and coffee are the substitute goods. If the price of tea goes down, the consumers may substitute tea for coffee, although price of coffee remains the same. Therefore, with a fall in price, the demand will increase due to favourable substitution effect. On the other hand with the rise in price, the demand falls due to unfavourable substitution effect. This is nothing but the application of Law of Demand.

3. Income Effect. Another reason for the downward slope of demand curve is the income effect. As the price of the commodity falls, the real income of the consumer goes up. Real income is that income which is measured in terms of goods and services. For example, a consumer has Rs.20, he wants to buy oranges whose price is Rs.20 per dozen. It means

44

the consumer can buy one dozen of oranges with his fixed income. Now, suppose, the price of the oranges falls to Rs.15 per dozen which leads to an increase in his real income by Rs.5. In this case, either the consumer will buy more quantity of oranges than before or he will buy some other commodity with his increased income.

4. New Consumers. When the price of commodity falls, many other consumers who were not consuming that commodity previously will start consuming the commodity. As a result, total market demand goes up. For example, if the price of radio set falls, even the poor man can buy the radio set. Consequently, the total demand for radios goes up.

5. Several Uses. Some commodities can be put to several uses which lead to downward slope of the demand curve. When the price of such commodities goes up they will be used for important purposes, so their demand will be limited. On the other hand, when the price falls, the commodity in question will extend its demand. For instance, when the price of coal increases, it will be used for important purposes but as the price falls its demand will increase and it will be used for many other uses.

6. Psychological Effects. When the price of a commodity falls, people favour to buy more which is natural and psychological. Therefore, the demand increases with the fall in prices. For example, when the price of silk falls, it is purchased for all the members of the family.

7.8 EXCEPTIONS TO THE LAW OF DEMAND

The Law of Demand will not hold good in certain peculiar cases in which more will be demanded at a higher price and less at a lower price. In these cases the demand curves will be exceptionally different, differing from the usual downward sloping shape of the demand curve. The exceptions are as follows:

(i) Conspicuous goods: Some consumers measure the utility of a commodity by its price i.e., if the commodity is expensive they think that it has got more utility. As such, they buy less of this commodity at low price and more of it at high price. Diamonds are often given as example of this case. Higher the price of diamonds, higher is the prestige value attached to them and hence higher is the demand for them.

ii) Giffen goods: Sir Robert Giffen, an economist, was surprised to find out that as the price of bread increased, the British workers purchased more bread and not less of it. This

was something against the law of demand. Why did this happen? The reason given for this is that when the price of bread went up, it caused such a large decline in the purchasing power of the poor people that they were forced to cut down the consumption of meat and other more expensive foods. Since bread even when its price was higher than before was still the cheapest food article, people consumed more of it and not less when its price went up.

Such goods which exhibit direct price-demand relationship are called 'Giffen goods'. Generally those goods which are considered inferior by the consumers and which occupy a substantial place in consumer's budget are called 'Giffen goods'. Examples of such goods are coarse grains like bajra, low quality of rice and wheat etc.

(iii) **Future expectations about prices:** It has been observed that when the prices are rising, households expecting that the prices in the future will be still higher tend to buy larger quantities of the commodities. For example, when there is wide-spread drought, people expect that prices of food grains would rise in future. They demand greater quantities of food grains as their price rise. But it is to be noted that here it is not the law of demand which is invalidated but there is a change in one of the factors which was held constant while deriving the law of demand, namely change in the price expectations of the people.

(iv) The law has been derived assuming consumers to be rational and knowledgeable about market-conditions. However, at times consumers tend to be irrational and make impulsive purchases without any cool calculations about price and usefulness of the product and in such contexts the law of demand fails.

(v) Similarly, in practice, a household may demand larger quantity of a commodity even at a higher price because it may be ignorant of the ruling price of the commodity. Under such circumstances, the law will not remain valid.

The law of demand will also fail if there is any significant change in other factors on which demand of a commodity depends. If there is a change in income of the household, or in prices of the related commodities or in tastes and fashion etc. the inverse demand and price relation may not hold good.

46

7.9 TYPES OF DEMAND

There are three types of demand. They are

1.   Price Demand

2.   Income Demand and

3.   Cross Demand which are explained below:

1. Price Demand

It refers to the various quantities of the good which consumers will purchase at a given time and at certain hypothetical prices assuming that other conditions remain the same. We are generally concerned with price demand only. In the explanation of the law of demand given above, we dealt in detail with price demand only.
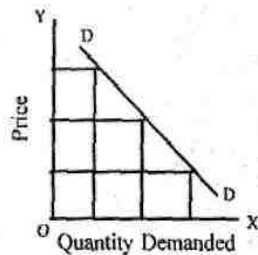
Fig - 3

Income demand: Income demand refers to the various quantities of a commodity that a consumer would buy at a given time at various levels of income. Generally, when the income increases, demand increases and vice versa.
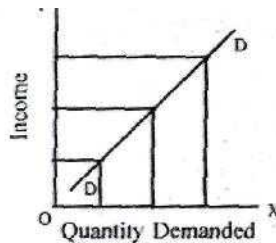
Fig - 4

Cross Demand: When the demand of one commodity is related with the price of other commodity is called cross demand. The commodity may be substitute or complementary.

47

Substitute goods are those goods which can be used in case of each other. For example, tea and coffee, Coca-cola and Pepsi. In such case demand and price are positively related. This means if the price of one increased then the demand for other also increases and vise versa. Complementary goods are those goods which are jointly used to satisfy a want. In other words, complementary goods are those which are incomplete without each other. These are things that go together, often used simultaneously. For example, pen and ink.
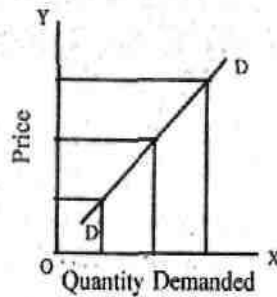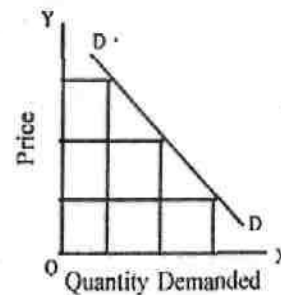
Fig – 5a   **Fig – 5b**

Tennis rackets and tennis balls, cameras and film, etc. In such goods the price and demand are negatively related. This means when the price of one commodity increases the demand for the other falls.

7.10. **Extension and Contraction of Demand**

The change in demand due to change in price only (when other factors remain constant) is called extension and contraction of demand. Increase in demand due to fall in price is called extension of demand. Decrease in demand due to rise in price is called contraction of demand. Extension and Contraction of demand results in movement on the same demand curve. It is shown in the following diagram.

48
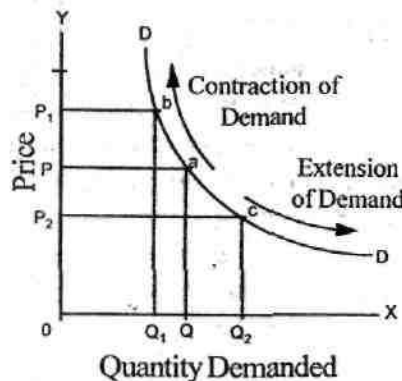
When price is OP, Fig - 6 ·manded is OQ. Suppose the price falls from OP_2 to $0P_2$ demand will be increased to OQ_2. This is a downward movement along the demand curve DD from a to c. This indicates extension of demand. When the price rises to OP_1, the demand will be decreased to OQ_2 this is an upward movement along the demand curve from a to b. This indicates contraction of demand.

7.11 Shift in Demand

We have seen that the demand depends not only on price but also on other factors like income, population, taste and preference of consumers etc. The change in demand due to change in any of the factors other than the price is'called shift in demand. Change in any one of the factors shifts the entire demand curve. A change in demand will shift the demand curve either upwards or downwards. An upward shift in demand curve is called increase in demand. Downward shift in demand curve is called decrease in demand. Shift in demand is shown in the following diagram.

Quantity Demand
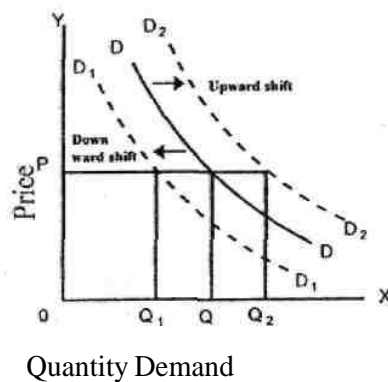
Fig - 7

In the given figure DD is the original demand curve. When the demand increases, (e.g., due to increase in income) the curve will shift upwards to D2D2 without any increase in price. It is constant at OP. Similarly when the demand decreases, (e.g., due to decrease in income) the curve will shift downwards to D1D1. The price remains constant.

Thus extension of demand is different from increase in demand. Likewise, contraction of demand doesn't mean decrease in demand.

49

It should be noted that exclusion and contraction of demand is called "change in quantity demanded" and shift in demand is called "change in demand".

7.12 Other Types of Demand

Joint demand: When several commodities are demanded for a joint purpose or to satisfy a particular want. It is a case of a joint demand. Milk, sugar and tea dust are jointly demanded to make tea. Similarly, we may demand paper, pen and ink for writing. Demand for such commodities in bunch is known as joint demand. Demand for land, labour, capital and organisation for producing commodity is also a case of joint demand.

Composite demand: The demand for a commodity which can be put to several uses is a composite demand. In this case a single product is wanted for a number of uses. For example, electricity is used for lighting, heating, for running the engine, for the fans etc. Similarly coal is used in industries, for cooking etc.

Direct and Derived demand: The demand for a commodity which is for direct consumption, i.e.. Demand for ultimate object, is called direct demand, e.g food, cloth, etc. Direct demand is called autonomous demand. Here the demand is not linked with the purchase of some main products. When the commodity is demanded as a result of the demand for another commodity or service, it is known as the derived demand or induced demand. For example, demand for cement is derived from the demand for building construction; demand for tires is derived from the demand for cars or scooters, etc.

Importance of the Law of Demand

The law of demand plays a crucial role in decision-making and forward planning of a business unit. The production planning in a firm mainly rests on accurate demand analysis. The law of demand has theoretical as well as practical advantages. These are as follows:

1. Price determination: With the help of law of demand a monopolist fixes the price of his product. He is able to decide the most profitable quantity of output for him.

2. Useful to government: The finance minister takes the help of this law to know the effects of his tax reforms and policies. Only those commodities which have relatively inelastic demand should be taxed.

3. Useful to farmers: From the law of demand, the farmer knows how far a good or bad crop will affect the economic condition of the fanner. If there is a good crop and demand for it remains the same, price will definitely go down. The farmer will not have much benefit from a good crop, but the rest of the society will be benefited.

4. In the field of planning: The demand schedule has great importance in planning for individual commodities and industries. In such cases it is necessary to know whether a given change in the price of the commodity will have the desired effect on the demand for commodity within the country or abroad. This is known from a study of the nature of demand schedule for the commodity.

7.13 INDIFFERENCE CURVE ANALYSIS

In the last section we discussed marginal utility analysis of demand. A very popular alternative and more realistic method of explaining consumer's demand is the Indifference Curve Analysis. This approach to consumer behaviour is based on consumer preferences. It believes that human satisfaction being a psychological phenomenon cannot be measured quantitatively in monetary terms as was attempted in Marshall's utility analysis. In this approach it is felt that it is much easier and scientifically more sound to order preferences than to measure them in terms of money.

The consumer preference approach, is, therefore an ordinal concept based on ordering of preferences compared with Marshall's approach of cardinality.

Assumptions Underlying Indifference Curve Approach

1. The consumer is rational and possesses full information about all the relevant aspects of economic environment in which he lives.
2. The consumer is capable of ranking all conceivable combinations of goods according to the satisfaction they yield. Thus if he is given various combinations say A, B, C, D, E he can rank them as first preference, second preference and so on.
3. If a consumer happens to prefer A to B, he can not tell quantitatively how much he prefers A to B.

51

4. If the consumer prefers combination A to B, and B to C, then he must prefer combination A to C. In other words, he has consistent consumption pattern behaviour.

5. If combination A has more commodities than combination B, then A must be preferred to B.

What are Indifference Curves? Ordinal analysis of demand (here we will discuss the one given by Hicks and Allen) is based on indifference curves. An indifference curve is a curve which represents all those combinations of goods which give same satisfaction to the consumer. Since all the combinations on an indifference curve give equal satisfaction to the consumer, the consumer is indifferent among them. In other words, since all the combinations provide same level of satisfaction the consumer prefers them equally and does not mind which combination he gets.

To understand indifference curves let us consider the example of a consumer who has one unit of food and 12 units of clothing. Now we ask the consumer how many units of clothing he is prepared to give up to get an additional unit of food, so that his level of satisfaction does not change. Suppose the consumer says that he is ready to give up 6 units of clothing to get an additional unit of food. We will have then two combinations of food and clothing giving equal satisfaction to consumer: Combination A has 1 unit of food and 12 units of clothing, combination B has 2 units of food and 6 units of clothing. Similarly, by asking the consumer further how much of clothing he will be prepared to forgo for successive increments in his stock of food so that his level of satisfaction remains unaltered, we get various combinations as given below:

Table Indifference Schedule

Table 2

Combination	Food	Clothing	MRS
A	1	12	
B	2	6	6
C	3	4	2
D	4	3	1

Now if we draw the above schedule we will get the following figure.

In Figure 8, an indifference curve IC is drawn by plotting the various combinations of the indifference schedule. The quantity of food is measured on the X axis and the quantity of clothing on the Y axis. As in indifference schedule, combinations lying on an indifference curve will give the consumer same level of satisfaction.
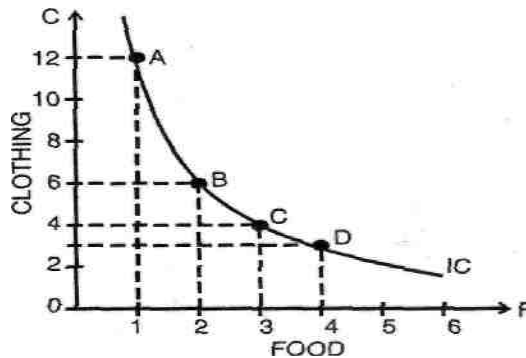

Fig. 8 : A Consumer's Indifference Curve

Indifference Map: A set of indifference curves is called indifference map.

An indifference map depicts complete picture of consumer's tastes and preferences. In Figure 9, an indifference map of a consumer is shown which consists of three indifference curves.

We have taken good X on X-axis and good Y on Y-axis. It should be noted that while the consumer is indifferent among the combinations lying on the same indifference curve, he certainly prefers the combinations on the higher indifference curve to the combinations lying on a lower indifference curve because a higher indifference curve signifies a higher level of .satisfaction. Thus while all combinations of IC, give same satisfaction, all combinations lying on IC2 give greater satisfaction than those lying on IC1

53
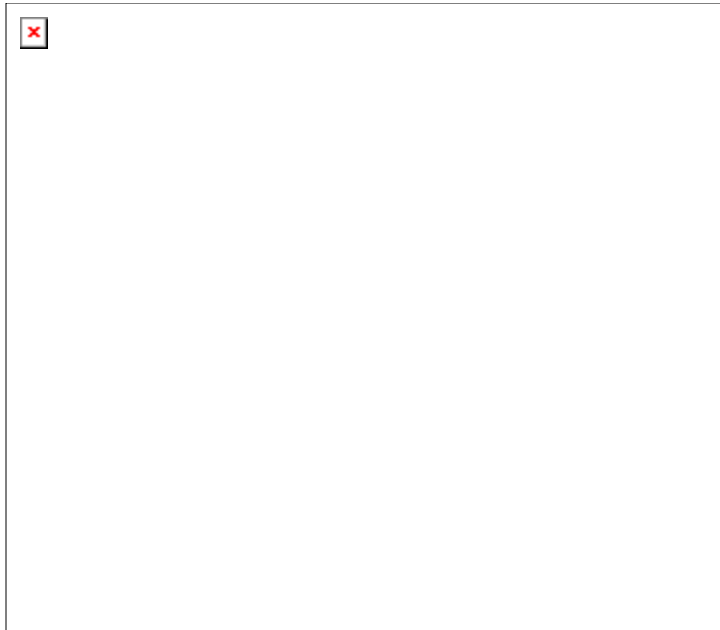
Fig. 9

Marginal Rate of Substitution: Marginal Rate of Substitution (MRS) is the rate at which the consumer is prepared to exchange goods X and Y Consider Table-2. In the beginning the consumer is consuming 1 unit of food and 12 units of clothing. Subsequently, he gives up 6 units of clothing to get an extra unit of food, his level of satisfaction remaining the same. The MRS here is 6. Like wise which he moves from B to C and from C to D in his indifference schedule, the MRS are 2 and 1 respectively. Thus, we can define MRS of X for Y as the amount of Y whose loss can just be compensated by a unit gain of X in such a manner that the level of satisfaction remains the same. We notice that MRS is falling i.e., as the consumer has more and more units of food, he is prepared to give up less and less units of cloths. There are two reasons for this.

1.   The want for a particular good is satiable so that when a consumer has its more quantity, his intensity of want for it decreases. Thus, when consumer in our example, has more units of food, his intensity of desire for additional units of food decreases.

2.   Most of the goods are imperfect substitutes of one another. If, they could substitute one another perfectly. MRS would remain constant.

54

Properties of Indifference Curves: The following are the main characteristics or properties of indifference curves :

(i) Indifference curves slope downward to the right: This property implies that when the amount of one good in combination is increased, the amount of the other good is reduced. This is essential if the level of satisfaction is to remain the same on an indifference curve.

(ii) Indifference curves are always convex to the origin: It has been observed that as more and more of one commodity (X) is substituted for another (Y), the consumer is willing to part with less and less of the commodity being substituted (i.e. Y). This is called diminishing marginal rate of substitution. Thus in our example of food and clothing, as a consumer has more and more units of food, he is prepared to forego less and less units of clothing. This happens mainly because want for a particular good is satiable and as a person has more and more of a good, his intensity of want for that good goes on diminishing. This diminishing marginal rate of substitution gives convex shape to the indifference curves. However, there are two extreme situations. When two goods are perfect substitutes of each other, the indifference curve is a straight line on which MRS is constant. And when two goods are perfect complementary goods (e.g. gasoline and water in a car), the indifference curve will consist of two straight line with a right angle bent which is convex to the origin or in other words, it will be L shaped.

(iii) Indifference curves can never intersect each other: No two indifference curves will intersect each other although it is not necessary that they are parallel to each other. In case of intersection the relationship becomes logically absurd because it would show that higher and lower levels are equal which is not possible. This property will be clear from the following Figure 10.
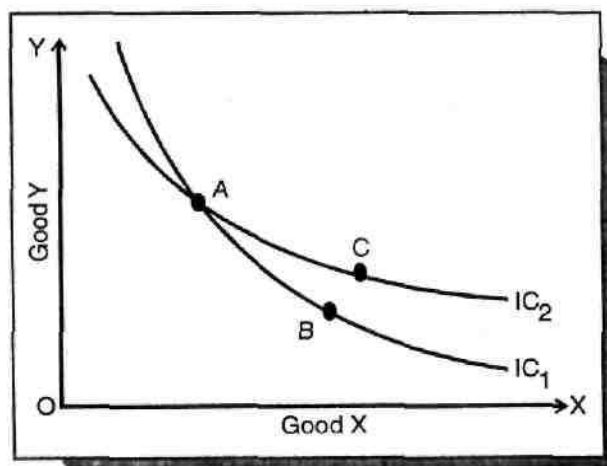
Intersecting Indifference Curves

Fig. 10

In figure 10 IC_1, and IC_2 intersect at A. Since A and B lie on IC_1, they give same satisfaction to the consumer. Similarly since A and C lie on IC_2, they give same satisfaction to the consumer. This implies that combination B and C are equal in terms of satisfaction. But a glance will show that this is an absurd conclusion because certainly combination C is better than combination B because it contains more units of commodities X and Y. Thus we see that no two indifference curves can touch or cut each other.

(iv) A higher indifference curve represents a higher level of satisfaction than the lower indifference curve: This is because combinations lying on a higher indifference curve contain mere of either one or both goods and more goods are preferred to less of them.

Budget line : A higher indifference curve shows a higher level of satisfaction than a lower one. Therefore, a consumer in his attempt to maximise satisfaction will try to reach the highest possible indifference curve. But in his pursuit of buying more and more goods and thus obtaining more and more satisfaction he has to work under two constraints : firstly, he has to pay the prices for the goods and, secondly, he has a limited money income with which to purchase the goods.

56

These constraints are explained by budget line or price line. In simple words a budget line shows all those combinations of two goods which the consumer can buy spending his given money income on the two goods at their given prices. All those combinations which are within the reach of the consumer (assuming that he spends all his money income) will lie on the budget line.
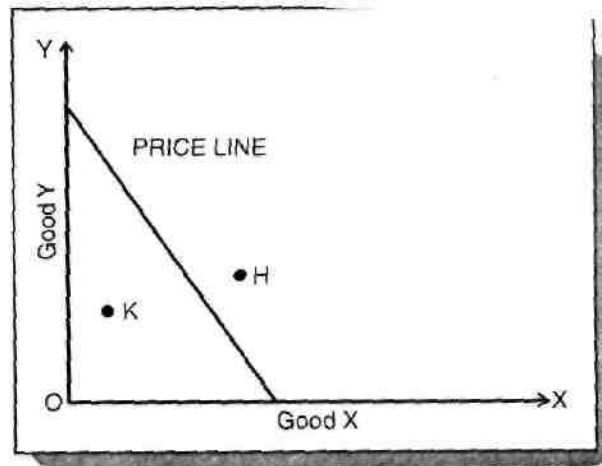

: Price Line

Fig. 11

It should be noted that any point outside the given price line, like H, will be beyond the reach of the consumer and any combination lying within the line, like K, shows under spending by the consumer.

2.6 Consumer's Equilibrium: Having explained indifference curves and budget line, we are in a position to explain how a consumer reaches equilibrium position. A consumer is in equilibrium when he is deriving maximum possible satisfaction from the goods and is in no position to rearrange his purchases of goods. We assume that :

(i)the consumer has a given indifference map which shows his scale of preferences for various combinations of two goods X and Y.

(ii)he has a fixed money income which he has to spend wholly on goods X and Y.

(iii)prices of goods X and Y are given and are fixed for him.

To show which combination of two goods X and Y the consumer will buy to be in equilibrium we bring his indifference map and budget line together.

We know by now, that the indifference map depicts the consumer's preference scale between various combinations of two goods and the budget line shows various
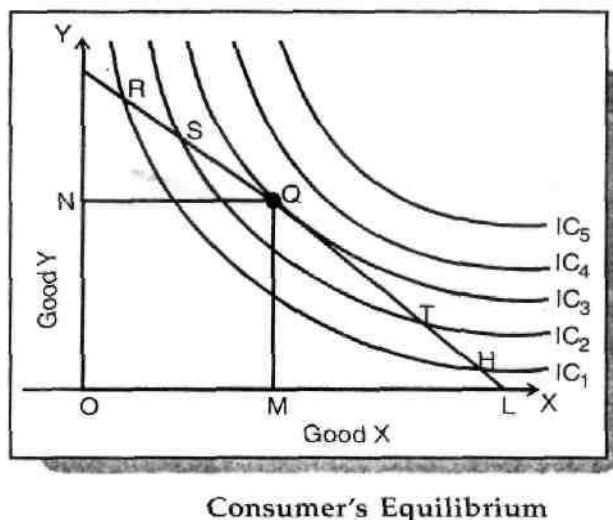
Consumer's Equilibrium

Fig. 12

combinations which he can afford to buy with his given money income and prices of the two goods. Consider Figure 12, in which IC_1, IC_2, IC_3, IC_4 and IC_5 are shown together with budget line PL for good X and good Y. Every combination on budget line PL costs the same. Thus combinations R, S, Q, T and H cost the same to the consumer. The consumer's aim is to _aximize his satisfaction and for this he will try to reach highest indifference curve.

But since there is a budget constraint he will be forced to remain on the given budget line, that is he will have to choose any combinations from among only those which lie on the given price line.

Which combination will he choose? Suppose he chooses R, but we see that R lies on a lower indifference curve IC_1, when he can very well afford S, Q or T lying on higher indifference curve. Similar is the case for other combinations on IC_1, like H. Again, suppose he chooses combination S (or T) lying on IC_2. But here again we see that the consumer can still reach a higher level of satisfaction remaining within his budget

constraints i.e., he can afford to have combination Q lying on IC_3 because it lies on his budget line. Now what if he chooses combination Q? We find that this is the best choice because this combination lies not only on his budget line but also puts him on highest possible indifference curve i.e., IC_3 The consumer can very well wish to reach IC_4 or IC_5, but these indifference curves are beyond his reach given his money income. Thus the consumer will be at equilibrium at point Q on IC_3. What do we notice at point Q? We notice that at this point, his budget line PL is tangent to the indifference curve IC_3. In this equilibrium position (at Q), the consumer will buy OM of X and ON of Y

At the tangency point Q, the slopes of the price line PL and indifference curve IC3 are equal. The slope of the indifference curve shows the marginal rate of substitution of X for Y (MRSxy)

which is equal to $\dfrac{MU_x}{MU_y}$ while the slope of the price line indicates the ratio between the

prices of two goods i.e., $\dfrac{P_x}{P_y}$

At equilibrium point Q,

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

Thus, we can say that the consumer is in equilibrium position when price line is tangent to the indifference curve or when the marginal rate of substitution of goods X and Y is equal to the ratio between the prices of the two goods.

7.14 LET US SUM UP

In this lesson we introduced a concept which establishes the relationship between Price and Sales called as 'Law of demand'. We also discussed in detail the reasons for Law of demand and pointed out some exceptional cases where Law of demand does not hold good.

We also identified various types of demand and a detailed discussion has been made on indifference curve analysis method to know about the consumers demand for a

commodity. At the end of this lesson we studied about the ways by which consumer reaches equilibrium position.

7.15 LESSON-END ACTIVITIES

1. Explain the various types of demand

2. Give reasons for the downward sloping demand curve

3. List the assumptions of indifference curve analysis

4. Explain Consumer's demand through indifference analysis

5. Elucidate how a consumer reaches equilibrium position.

7.16 REFERENCES

1. Perloff, Jeffrey, M., "Micro Economics", Pearson Education Asia.

2. Maurice Thomas: Managerial Economics, Irwin McGraw Hill, Intl. Educations.

Lesson: 8 –ELASTICITY OF DEMAND

CONTENTS

8.0 Aims and Objectives

8.1 Introduction

8.3 Elasticity of Demand

8.4 Definition of Price Elasticity of Demand

8.5 Factors determining Price Elasticity of Demand

8.6 Measurement of Price Elasticity of Demand

8.7 Income Elasticity of Demand

8.8 Cross Elasticity of Demand

8.9 Importance of Elasticity of Demand

8.4 Let us sum up

8.5 Lesson –End activities

8.6 References

8.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To Understand the concept of Elasticity
- To Know the different kinds of Elasticity of demand
- To acquire knowledge on the importance of elasticity of demand

8.1 INTRODUCTION

In this lesson a detailed discussion regarding elasticities as a measure of the responsiveness of one item to changes in another item is made. Elasticity is a common concept that economists, Business people and others rely upon for the measurement between two variables say for example the ratio of percentage change in quantity demanded to percentage change in some other factor like Price or Income.

8.2 Elasticity of Demand

The concept of price-elasticity of demand was first of all introduced in economics by Dr. Marshall. In simple words, price elasticity of demand is the ratio of percentage

change in quantity demanded to the percentage change in price. In other words, price elasticity of demand is a measure of the relative change in quantity purchased of a good in response to a relative change in its price. It is, thus a rate at which the demand changes to the given change in prices. So, it means the rate or the degree of response in demand to the change in price. Thus, the co-efficient of price-elasticity of demand can be expressed as under:

$$E_d = \frac{\Pr oportionate\ change\ in\ Quantity\ Demanded}{\Pr oportionate\ change\ in\ price}$$

8.3 Definitions of Price Elasticity of Demand

The concept of price elasticity of demand has been defined by different economists as under :

According to **Alfred Marshall**: "Elasticity of demand may be defined as the percentage change in quantity demanded to the percentage change in price."

According to **A.K. Cairncross** : "The elasticity of demand for a commodity is the rate at which quantity bought changes as the price changes."

According to **J.M. Keynes** : "The elasticity of demand is a measure of the relative change in quantity to a relative change in price."

According to Kenneth Boulding : "Elasticity of demand measures the responsiveness of demand to changes in price."

8.4 DEGREES OF PRICE ELASTICITY

Different commodities have different price elasticities. Some commodities have more elastic demand while others have relative elastic demand. Basically, the price elasticity of demand ranges from zero to infinity. It can be equal to zero, less than one, greater than one and equal to unity.

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

However, some particular values of elasticity of demand have been explained as under ;

Perfectly Elastic Demand.

Perfectly elastic demand is said to h appen when a little change in price leads to an infinite change in quantity demanded. A small rise in price on the part of the seller reduces the demand to zero. In such a case the shape of the demand curve will be horizontal straight line as shown in figure 13
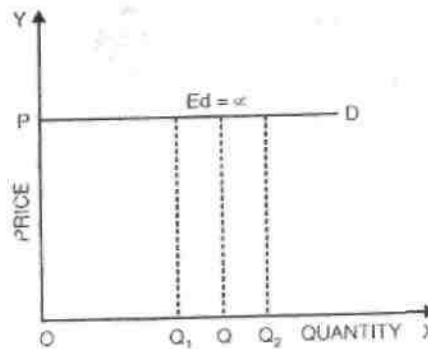

Fig - 13

The figure 13 shows that at the ruling price OP, the demand is infinite. A slight rise in price will contract the demand to zero. A slight fall in price will attract more consumers but the elasticiy of demand will remain infinite. But in real world, the cases of perfectly elastic demand are exceedingly rare and are not of any practical interest.

2. Perfectly inelastic Demand

Perfectly inelastic demand is opposite to perfectly elastic demand. Under the perfectly inelastic demand, irrespective of any rise or fall in price of a commodity, the quantity demanded remains the same. The elasticity of demand in this case will be equal to zero.In diagram 14, DD shows the perfectly inelastic demand. At price OP, the quantity demanded is OQ. Now, the price falls to OP, from OP_1, demand remains the same. Similarly, if the price rises to OP_2 the demand still remains the same. But just as we do not see the example of perfectly elastic demand in the real world, in the same fashion it is diffcult to come across the cases of perfectly inelastic demand because even the demand for bare essentials of life does show some degree of responsiveness to change in price.
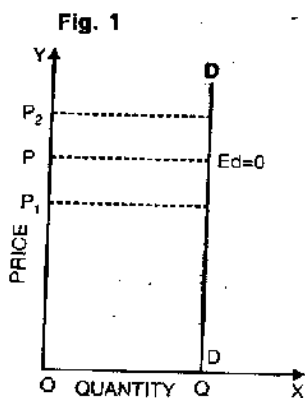
63

Fig. 14

3. Unitary Elastic Demand. The demand is said to be unitary elastic when a given proportionate change in the price level brings about an equal proportionate change in quantity demanded, The numerical value of unitary elastic demand is exactly one i.e., $ed = 1$. Marshall calls it unit elastic.

In figure 15, DD demand curve represents unitary elastic demand. This demand curve is called rectangular hyperbola. When price is OP, the quantity demanded is OQ_1. Now price falls to OP_1, the quantity demanded increases to OQ_1. The shaded area in the fig. equal in terms of price and quantity demanded denotes that in all cases price elasticity of demand is equal to one.
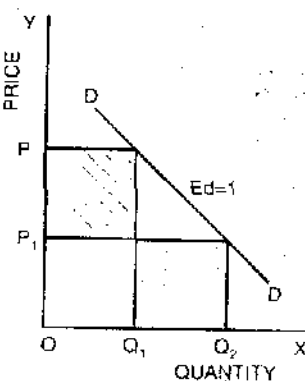
Fig - 15

4. Relatively Elastic Demand.

64

Relatively elastic demand refers to a situation in which a small change in price leads to a big change in quantity demanded. In such a case elasticity of demand is said to be more than one. This has been shown in figure 16.

In fig.16, DD is the demand curve which indicates that when price is OP the quantity demanded is OQ_1, Now the price falls from OP to OP_1, the quantity demanded increases from OQ_1 to OQ_2 i.e. quantity demanded changes more than the change in price.

5. Relatively Inelastic Demand.

Under the relatively inelastic demand a given percentage change in price produces a relatively less percentage change in quantity demanded. In such a case elasticity of demand is said to be less than one as shown in figure 17.

All the five degrees of elasticity of demand have been shown in figure 18. On OX axis, quantity demanded and on OY axis price is given. It shows:

1.   AB — Perfectly Inelastic Demand
2.   CD — Perfectly Elastic Demand
3.   EQ — Less Than Unitary Elastic Demand
4.   EF — Greater Than Unitary Elastic Demand
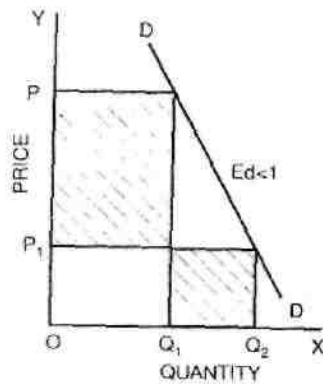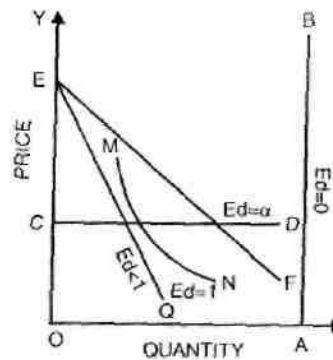5.   MN — Unitary Elastic Demand.

Fig. 17   **Fig. 18**

8.5 FACTORS DETERMINING PRICE ELASTICITY OF DEMAND

The factors that determine elasticity of demand are numberless. But the most important among them are the nature, uses and prices of related goods and the level of income. They are stated below:

I. Nature of the commodity: Generally, all commodities can be dividend into three categories i.e.

(i) Necessaries of Life. For necessaries of life the demand is inelastic because people buy the required amount of goods whatever their price. For example, necessaries such as rice, salt, cloth are purchased whether they are dear or cheap.

(ii) Conventional Necessaries. The demand for conventional necessaries is less elastic or inelastic. People are accustomed to the use of goods like intoxicants which they purchase at any price. For example, drunkards consider opium and wine almost as a necessity as food and water. Therefore, they buy the same amount even when their prices are higher and highest.

(iii) Luxury Commodities. The demand for luxury is usually elastic as people buy more of them at a lower price and less at a higher price. For example, the demand of luxuries like silk, perfumes and ornaments increases at a lower price and diminishes at a higher price. Here, we must keep in mind that luxury is a relative term, which varies from person to person, place to place and from time to time. For example, what is a luxury to a poor man is a necessity to the rich. The luxury of the past may become a necessity of today. Similarly a commodity which is a necessity to one class may be a luxury to another. Hence, the elasticity of demand in such cases should have to be carefully expressed.

2. Substitutes. Demand is elastic for those goods which have substitutes and inelastic for those goods which have no substitutes. The availability of substitutes, thus, determines the elasticity of demand. For instance, tea and coffee are substitutes. The change in the price of tea affects the demand for coffee. Hence, the demand for coffee and tea is elastic.

3. Number of Uses. Elasticity of demand for any commodity depends on its number of uses. Demand is elastic; if a commodity has more uses and inelastic if it has only one use. As coal has multiple uses, if its price falls it will be demanded more for cooking, heating,

industrial purposes etc. But if its price rises, minimum will be demanded for every purpose.

4. Postponement. Demand is more elastic for goods the use of which can be postponed. For example, if the price of silk rises, its consumption can be postponed. The demand for silk is, therefore, elastic. Demand is inelastic for those goods the use of which is urgent and, therefore, cannot be postponed. The use of medicines cannot be put off. Hence, the demand for medicines is inelastic.

5. Raw Materials and Finished Goods. The demand for raw materials is inelastic but the demand for finished goods is elastic. For instance, raw cotton has inelastic demand but cloth has elastic demand. In the same way, petrol has inelastic demand but car itself has only elastic demand.

6. Price Level. The demand is elastic for moderate prices but inelastic for lower and higher prices. The rich and the poor do not bother about the prices of the goods that they buy. For example, rich buy Benaras silk and diamonds etc. at any price. But the poor buy coarse rice, cloth etc. whatever their prices are.

7. Income Level. The demand is inelastic for higher and lower income groups and elastic for middle income groups. The rich people with their higher income do not bother about the price. They may continue to buy the same amount whatever the price. The poor people with lower incomes buy always only the minimum requirements and, therefore, they are induced neither to buy more at a lower price nor less at a higher price. The middle income group is sensitive to the change in price. Thus, they buy more at a lower price and less at higher price.

8. Habits. If consumers are habituated of some commodities, the demand for such commodities will be usually inelastic. It is because that the consumer will use them even their prices go up. For example, a smoker does not smoke less when the price of cigarette goes up.

9. Nature of Expenditure. The elasticity of demand for a commodity also depends as to how much part of the income is spent on that particular commodity. The demand for such commodities where a small part of income is spent is generally highly inelastic i.e.

newspaper, boot-polish etc. On the other hand, the demand of such commodities where a significant part of income is spent, elasticity of demand is very elastic.

10. Distribution of Income. If the income is uniformly distributed in the society, a small change in price will affect the demand of the whole society and the demand will be elastic. In case of unequal distribution of income and wealth, a change in price will hardly influence the poor section of the society and the demand will be relatively inelastic.

11. Influence of Diminishing Marginal Utility. We know that utility falls when we consume more and more units but not in a uniform way. In case utility falls rapidly, it means that the consumer has no other near substitutes. As a result, demand is inelastic. Conversely, if the utility falls slowly, demand for such commodity would be elastic and raises much for a fall in price.

8.6 MEASUREMENT OF PRICE ELASTICITY OF DEMAND

There are five methods to measure the price elasticity of demand.

1. Total Expenditure Method.

2. Proportionate Method.

3. Point Elasticity of Demand.

4. Arc Elasticity of Demand.

5. Revenue Method.

Total Expenditure Method

Dr. Marshall has evolved the total expenditure method to measure the price elasticity of demand. According to this method, elasticity of demand can be measured by considering the change in price and the subsequent change in the total quantity of goods purchased and the total amount of money spend on it.

Total Outlay = Price x Quantity Demanded.

There are three possibilities:

(i) If with a fall in price (demand increases) the total expenditure increases or with a rise in price (demand falls) the total expenditure falls, in that case the elasticity of demand is greater than one i.e. (Ed >1.)

(ii) If with a rise or fall in the price (demand falls or rises respectively), the total expenditure remains the same, the demand will be unitary elastic i.e. (Ed = 1).

(iii) with a fall in price (Demand rises), the total expenditure also falls, and with a rise in price (Demand falls) the total expenditure also rises, the demand is said to be less elastic or elasticity of demand is less than one i.e. (Ed <1).

Table Representation: The method of total expenditure has been explained with the help of Table 3.

Table 3

Price (P)	Quantity Demanded (Q)	Total Outlay	Elasticity of demand (Ed)
10	1	.10	
9	2	18	
8	3	24	Ed > 1
7	4	28	
6	5	.30	Ed = 1
5	6	30	
4	7	.28	
3	8	24	
2	9	18	
1	10	10	Ed < 1

In the above Table 3, we find three possibilities:

1. More Elastic Demand. When price is Rs. 10 the quantity demanded is 1 unit and total expenditure is 10. Now price falls from Rs. 10 to Rs. 6, the quantity demanded increases from 1 to 5 units and correspondingly the total expenditure increases from Rs. 10 to Rs. 30. Thus it is clear that with the fall in price, the total expenditure increases and vice-versa.   So elasticity of demand is greater than one or Ed > 1.

2.Unitary Elastic Demand. If price is Rs. 6, demand is 5 units so the total outlay is Rs. 30. Now price falls to Rs. 5, the demand increases to 6 units but the total expenditure remains the same i.e., Rs. 30. Thus it is clear that with the rise or fall in price, the total expenditure remains the same. The elasticity of demand in this case is equal to one or Ed = 1.

69

3.Less Elastic Demand. If price is Rs. 5, demand is 6 and total outlay is Rs. 30. Now price falls from Rs. 5 to Re. 1. The demand increases from 6 units to 10 units and hence the total expenditure falls from Rs. 30 to Rs. 10. Thus it is clear that with the fall in price, the total expenditure also falls and vice-versa. In this case, the elasticity of demand is less
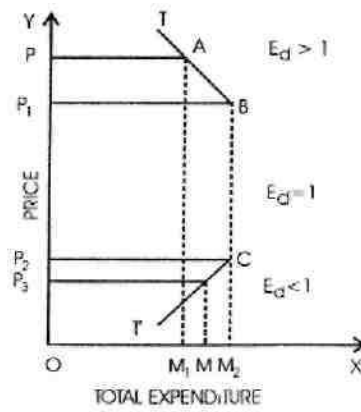
than one or Ed<l.

Fig. 19

Diagrammatic Representation:

Measurement of price elasticity through total expenditure method can be shown with the help of fig. 19

In the figure 19 total expenditure has been shown on X-axis and price on Y-axis. Line TT' is the total expenditure line. When price of the commodity falls from OP to OP1 total expenditure increases from OM1 to OM2. The elasticity of demand is greater than one as is shown in TB portion of the figure. Now, suppose that the price of the commodity decreases from OP^1 to OP^3 the total expenditure falls from OM2 to OM. This is shown in T'C part of the figure which represents the less than unity elasticity of demand. In the same way, BC part of the figure represents the unit elasticity of demand. Thus it is clear that the changes in total expenditure due to changes in price also affect the elasticity of demand.

Proportionate Method

This method is also associated with the name of Dr. Marshall. According to this method, "price elasticity of demand is the ratio of percentage change in the amount

demanded to the percentage change in price of the commodity." It is also known as the Percentage Method, Flux Method, Ratio Method, and Arithmetic Method.

$$E_d = \frac{\Pr oportionate\ change\ in\ Quantity\ Demanded}{\Pr oportionate\ change\ in\ price}$$

Arc Elasticity of Demand

According to **Prof. Baumol:** "Arc elasticity is a measure of the average responsiveness to price change exhibited by a demand curve over some finite stretch of the curve".

According to **Watson:** "Arc elasticity is the elasticity at the mid-point of an are of a demand curve."

According to **Leftwitch :** "When elasticity is computed between two separate points on a demand curve, the concept is called Are elasticity."

This method of measuring elasticity of demand is also known as

"Average Elasticity".   In this method, we use $\frac{P_1 + P_2}{2}$ rather than P

Thus, we apply $\frac{Q_1 + Q_2}{2}$ rather than q   The formula for Arc elasticity of demand is as follows:

Arc Elasticity of Demand (EA)

Change in demand

Original demand + New demand
= ---
Change in price

Original Price + New Price

Are elasticity of demand in   notational farm can be express

where

Q1 = Original quantity demanded

Q2 = New quantity demanded

P1 = Original price

P2 = New price

This can be shown with the help of a diagram 20.

In figure 20 quantity is measured on X-axis while price on Y- axis. DD is the demand curve. Now if we want to measure the arc elasticity between A and B on the demand curve DD, we will have to take the average of prices OPl and OP2 as well as of quantities; Q1 and Q2.

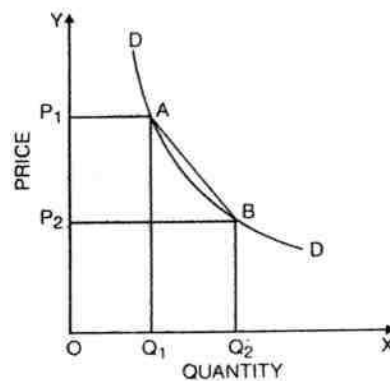$$E_A = \frac{[P + (P + \Delta P)]}{[Q + (Q + \Delta Q)]} \times \frac{\Delta Q}{\Delta P}$$

Fig. 20

Revenue Method

Mrs.; Joan Robinson has given this method. She says that elasticity of demand can be measured with the help of average revenue and marginal revenue. Therefore, a sale proceeds that a firm obtains by selling its products is called its revenue. However, when total revenue is divided by the number of units sold, we get average revenue. On the contrary, when addition is made to the total revenue by the sale of one more unit of the commodity is called marginal revenue. Therefore, the formula to measure elasticity of demand can be written as,

72

$$E_d = \frac{A}{A-M}$$

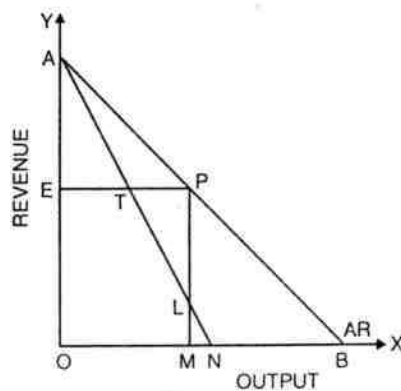
Fig - 21

where Ed represents elasticity of demand, A = average revenue and M = marginal revenue. This method can be explained with the help of diagram 21.

In this diagram 21 revenue has been shown on OY-axis while quantity of goods on OX-axis. AB is the average revenue or demand curve and AN is the marginal revenue curve. At point P on demand curve, elasticity of demand is calculated with the formula,

$$E_p = \frac{LowerPortion}{UpperPortion} \, or \, \frac{PB}{PA}$$

We can see in the figure that ∆AEP and ∆PMB are similar, thus ratio of their sides is also equal.

$$E_p = \frac{PB}{PA} = \frac{PM}{AE}$$

and; ∆AET and ∆TPL are congruent triangles, therefore PL = AE. Putting PL in place of AE in the above equation, we shall get

$$E_p = \frac{PM}{PL}$$

(Because PL = PM—LM)

73

$$E_p = \frac{PM}{PM - LM}$$

(Where PM = AR and LM = MR)

.There fore, $E_p = \dfrac{PM}{PM - LM} = \dfrac{AR}{AR - MR} \, or \, \dfrac{A}{A - M}$

In this way, if value of Ep is one it means that price elasticity of demand is unitary. Similarly, if it is more than one, price elasticity of demand is greater than one and if it is less than one, price elasticity of demand is less than unity.

8.7 INCOME ELASTICITY OF DEMAND

According to **Stonier and Hague**: "Income elasticity of demand shows the way in which a consumer's purchase of any good changes as a result of change in his income."

It shows the responsiveness of a consumer's purchase of a particular commodity to a change in his income. Income elasticity of demand means the ratio of percentage change in the quantity demanded to the percentage change in income. In brief income elasticity.

$$I_e = \frac{proportionate \ change \ in \ quantity \ purchased}{proportionate \ change \ in \ income}$$

$$I_e = \frac{percentage \ change \ in \ demand}{percentage \ change \ in \ income}$$

Degrees of Income Elasticity of Demand

Positive income elasticity of Demand : Positive income elasticity of demand is said to occur when with the increase in the income of the consumer, his demand for goods and services also increases and vice-versa. Income elasticity of demand is positive in case of normal goods.

In fig. 22, quantity of commodity T has been measured on X-axis and income of the consumer on Y-axis. DD is the positive income elasticity of demand curve. It

74

slopes upward from left to right indicating that increase in income is accompanied by increase in demand of goods and services and vice-versa.
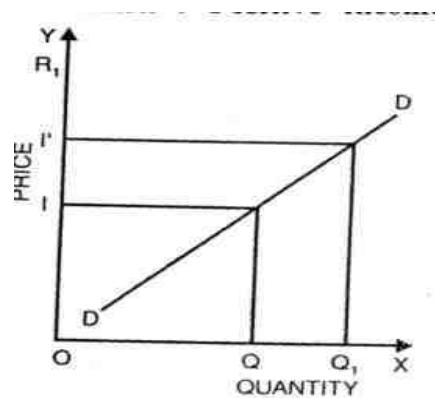
Fig. 22

1.Income Elasticity is Unity. The change in demand is proportionate to the change in income.   For example

$$\text{Income Elasticity} = 1 \text{ when } \frac{25\% \ change \ in \ demand}{25\% \ change \ in \ income}$$

2. Income Elasticity Greater than One. When the change in demand is more than proportionate change in income, income elasticity of demand is greater than one or unity. For example,

$$\text{Income Elasticity} > 1 \text{ when } \frac{15\% \ change \ in \ demand}{10\% \ change \ in \ income} = 1.5$$

3. Income Elasticity Less than One. If change in demand is less than proportionate change in income, income elasticity of demand is less than one or unity.   For example.

$$\text{Income Elasticity} < 1 \text{ when } \frac{20\% \ change \ in \ demand}{40\% \ change \ in \ income} = 0.5$$

(ii) Negative Income Elasticity of Demand: Negative income elasticity of demand is said to occur when increase in the income of the consumers is accompanied by fall in demand of goods and services and vice-versa.   It is the case of giffen goods.

In fig. 23 when income of the consumer is 01, demand for goods and services   is OX. Now   as   the income I1 increases to I1 quantity demanded falls   o to OX1. Again

76

as the income increases to I2, quantity   demanded falls to OX2. DD is the negative income elasticity of demand curve.
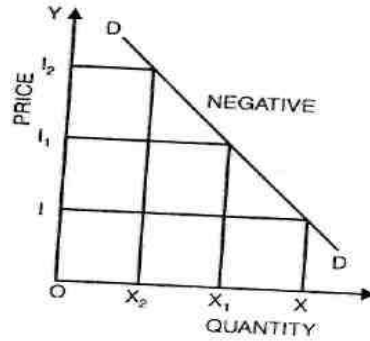

Fig. 23

(iii) Zero Income Elasticity of Demand: Zero income elasticity of demand is said to exist when increase or decrease in income has no impact on the demand of goods and services.

In fig. 24 initially when income is OI, quantity demanded is OD. Now, income   increases   to   OI2   demand Remains constant i.e. OD. Even when income reduces to 01 , quantity demanded remains OD

Generally, as income increases demand for goods increases. But in some cases, demand may not change to change in income or demand may diminish for an increase in income. The former case represents zero income elasticity. Income elasticity is zero if a change in income fails to produce any change in demand. Income elasticity is negative, if an increase in income leads to a reduction of demand. This happens only in the case of inferior goods. But in all other cases it is positive.
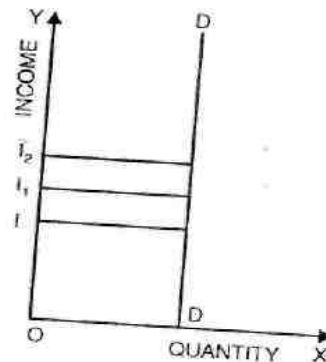
In short income elasticity is greater than one for luxuries but less than one for necessaries.

8.8 CROSS ELASTICITY OF DEMAND

It is the ratio of proportionate change in the quantity demanded of Y to a given proportionate change in the price of the related commodity X. It is a measure of relative change in the quantity demanded of a commodity due to a change in the price of its substitute complement.

It can be expressed as

$$C_e = \frac{proportionate\ change\ in\ the\ quantity\ demanded\ of\ Y}{proportionate\ change\ in\ the\ price\ of\ X}$$

Cross elasticity may be infinite or zero. It is infinite if the slightest change in the price of X causes a substantial change in the quantity demanded of Y. It is always the case with goods which have perfect substitutes for one another.

Fig - 24

Cross elasticity is zero, if a change in the price of one commodity will not affect the quantity demanded of the other. In the case of goods which are not related to each other, cross elasticity of demand is zero.

Types of Cross Elasticity of Demand

1.Positive :   When goods are substitute of each other than cross elasticity of demanded is positive. In other words, when an increase in the price of Y leads to an increase in the demand of X. For instance with the increase in price of a tea, demand of coffee will increase. In fig 25 Quantity has been measured on OX axis and price on OY axis. At price OP of Y commodity, demand of X – commodity is OM. Now as price Of Y commodity increase to OP1 demand of X-commodity increases to OM1. Thus, cross, elasticity of demand is positive.

2. Negative: In case of complementary goods, cross elasticity of demand is negative. A proportionate increase in price of one commodity leads to a proportionate fall in the demand, of .another commodity because both are demanded jointly

78

In fig. 26 quantity has been measured on OX-axis while price has been measured on OY-axis. When the price of commodity increases from OP to OP_1 quantity demanded falls from OM to OM_1 Thus, cross elasticity of demand is negative.
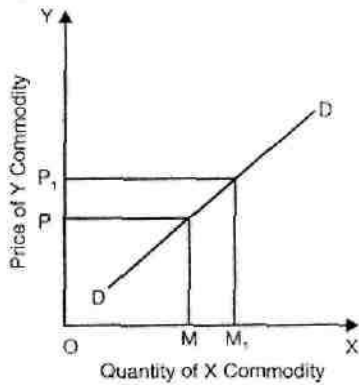

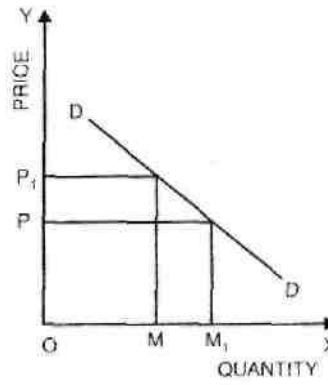Fig. 25   Fig. 26

3. Zero: Cross elasticity of demand is zero when two goods are related to each other. For instance, increase in price of car does not affect the demand of cloth. Thus, cross elasticity of demand is zero. It has been shown in fig. 27

Therefore, it can be concluded that cross elasticity depends upon Substitutability is perfect, cross elasticity is infinite; if on the other hand, substitutability does not exist, cross elasticity is zero. In the case of complementary goods like jointly demanded goods cross elasticity is negative. A rise in the price of one commodity X will mean not only decrease in the quantity of X but also decrease in the quantity demanded of Y because both are demanded together.
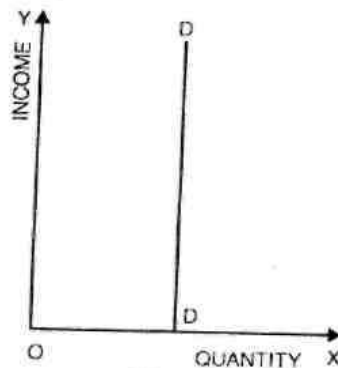

Fig - 27

79

Limitations of Cross Elasticity of Demand

The cross elasticity of demand is a useful measure of price-demand relationships between commodities. But this concept has following two limitations.

1. Negative Cross Elasticity does not always mean complementarily.

2. Cross Elasticity of Demand is only a one-way Relationship.

8.9 IMPORTANCE OF ELASTICITY OF DEMAND

The concept of elasticity of demand is of great importance in practical life. Its main points are given as under:

1. Useful for Business: It enables the business in general and the monopolists in particular to fix the price. Studying the nature of demand the monopolist fixes higher prices for those goods which have inelastic demand and lower prices for goods which have elastic demand. In this way, this helps him to maximise his profit.

2. Fixation of Prices: It is very useful to fix the price of jointly supplied goods. In the case of joint products like paddy and straw, the cost of production of each is not known. The price of each is then fixed by its elastic and inelastic demand.

3. Helpful to Finance Minister: It helps the Finance Minister to levy tax on goods. After levying taxes more and more on goods which have inelastic demand, the Government collects more revenue from the people without causing them inconvenience. Moreover, it is also useful for the planning.

4. Fixation of Wages: It guides the producers to fix wages for labourers. They fix high or low wages according to the elastic or inelastic demand for the labour.

5. In the Sphere of International Trade: It is of greater significance in the sphere of international trade. It helps to calculate the terms of trade and the consequent gain from foreign trade. If the demand for home product is inelastic, the terms of trade will be profitable to the home country.

6. Paradox of Poverty. It explains the paradox of poverty in the midst of plenty. A bumper crop instead of bringing prosperity may result in disaster, if the demand for it is inelastic. This is specially so, if the products are perishable and not storable.

7. Significant for Government Economic Policies. The knowledge of elasticity of demand is very important for the government in such matters as controlling

80

of business cycles, removing inflationary and deflationary gaps in the economy. Similarly, for price stabilization and the purchase and sale of stocks, information about elasticity of demand is most useful.

8. Determination of Price of Public Utilities. This concept is significant in the determination of the prices of public utility services. Economic welfare of the society largely depends upon the cheap availability

8.10 LET US SUM UP

In this lesson we studied the concept of elasticity which is the slope relationship of two variables expressed in percentage terms. We discussed about price elasticity, income elasticity and cross elasticity of demand. While concluding this lesson we also looked into the general importance of elasticity of demand

8.11 LESSON –END ACTIVITIES

1. Explain the degrees of Price elasticity of demand

2. Discuss the various methods to measure the price elasticity of demand

3. Explain about income elasticity of demand

4. Distinguish Income elasticity and Cross elasticity of demand

8.12 REFERENCES

1. Petersen, H. Craig and W. Cris Lewis, Managerial Economics.

2. Mote, V.L., Samuel Paul and G.S. Gupta, Managerial Economics, Concepts and Cases, Tata McGraw Hill.

Lesson: 9 – DEMAND FORECASTING

CONTENTS

9.0 Aims and Objectives

9.1 Introduction

9.2 Meaning of demand forecasting

9.3 Objectives of demand forecasting

9.4 factors affecting demand forecasting

9.5 Methods of demand forecasting for established products

9.6 Methods of demand forecasting for new products

9.7 Let us sum Up

9.8 Lesson – end activities

9.9 References

9.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To familiarize the meaning and objectives of demand forecasting
- To identify the factors that affects the demand forecasting
- To know about the various methods of demand forecassing

9.1 INTRODUCTION

Today business enterprises are working under the conditions of uncertainties. Uncertainties can be minimized through planning and forecasting. The success of a business firm depends upon its ability to forecast future events.

9.2 Meaning of Demand Forecasting

Future is uncertain. There is great deal of uncertainty with regard to demand. Since the demand is uncertain, production, cost, revenue, profit etc. are also uncertain. Through forecasting it is possible to minimise the uncertainties.

Forecasting simply refers to estimating or anticipating future events. It is an attempt to foresee the future by examining the past. Thus demand forecasting means estimating or anticipating future demand on the basis of past data.

9.3 Objectives of Demand Forecasting

A. Short Term Objectives

1. To help in preparing suitable sales and production policies.
2. To help in ensuring a regular supply of raw materials.
3. To reduce the cost of purchase and avoid unnecessary purchase.
4. To ensure best utilization of machines.
5. To make arrangements for skilled and unskilled workers so that suitable labour force may be maintained.
6. To help in the determination of a suitable price policy.
7. To determine financial requirements.
8. To determine separate sales targets for all the sales territories.
9. To eliminate the problem of under or over production.

B. Long term Objectives

1. To plan long term production.
2. To plan plant capacity.
3. To estimate the requirements of workers for long period and make arrangements.
4. To determine an appropriate dividend policy.
5. To help the proper capital budgeting.
6. To plan long term financial requirements.
7. To forecast the future problems of material supplies and energy crisis.

9.4 Factors Affecting Demand Forecasting

For making a good forecast, it is essential to consider the various factors governing demand forecasting. These factors are summarized as follows.

1. Prevailing business conditions: While preparing demand forecast it becomes necessary to study the general economic conditions very carefully. These include the

price level changes, change in national income, percapita income, consumption pattern, savings and investment habits, employment etc.

2. Conditions within the industry: Every business enterprise is only a unit of a particular industry. Sales of that business enterprise are only a part of the total sales of that industry. Therefore, while preparing demand forecasts for a particular business enterprise, it becomes necessary to study the changes in the demand of the whole industry, number of units within the industry, design and quality of product, price policy, competition within the industry etc.

3. Conditions within the firm: Internal factors of the firm also affect the demand forecast. These factors include plant capacity of the firm, quality of the product, price of the product, advertising and distribution policies, production policies, financial policies etc.

4. Factors affecting export trade: If a firm is engaged in export trade also it should consider the factors affecting the export trade. These factors include import and export control, terms and conditions of export, exim policy, export conditions, export finance etc.

5. Market behaviour : While preparing demand forecast, it is required to consider the market behavior which brings about changes in demand.

6. Sociological conditions: Sociological factors have their own impact on demand forecast of the company. These conditions relate to size of population, density, change in age groups, size of family, family life cycle, level of education, family income, social awareness etc.

7. Psychological conditions: While estimating the demand for the product, it becomes necessary to take into consideration such factors as changes in consumer tastes, habits, fashions, likes and dislikes, attitudes, perception, life styles, cultural and religious bents etc.

8. Competitive conditions: The competitive conditions within the industry may change. Competitors may enter into market or go out of market. A demand forecast prepared without considering the activities of competitors may not be correct.

Process of Demand Forecasting/ Steps in Demand Forecasting

Demand forecasting involves the following steps:

84

1. Determine the purpose for which forecasts are used.

2. Subdivide the demand forecasting programme into small I parts on the basis of product or sales territories or markets.

3. Determine the factors affecting the sale of each product and their relative importance.

4. Select the forecasting methods.

5. Study the activities of competitors.

6. Prepare preliminary sales estimates after, collecting necessary data.

7. Analyse advertisement policies, sales promotion plans, personal sales arrangements etc. and ascertain how far these programmes have been successful in promoting the sales.

8. Evaluate the demand forecasts monthly, quarterly, half yearly or yearly and necessary adjustments should be done.

9. Prepare the final demand forecast on the basis of preliminary forecasts and the results of evaluation.

9.5 METHODS OF DEMAND FORECASTING (FOR ESTABLISHED PRODUCTS)

There are several methods to predict the future demand. All methods can be broadly classified into two. (A) Survey methods, (B) Statistical methods

(A) Survey methods

Under this method surveys are conducted to collect information about the future purchase plans of potential consumers. Survey methods help in obtaining information about the desires, likes and dislikes of consumers through collecting the opinion of experts or by interviewing the consumers. Survey methods are used for short term forecasting. Important survey methods are (a) consumers interview method, (b) collective opinion or sales force opinion methodic) experts opinion method, (d) consumers clinic and (f) end use method.

(a) Consumers' interview method (Consumers survey): Under this method, consumers are interviewed directly and asked the quantity they would like to buy. After collecting the data, the total demand for the product is calculated. This is done by adding up all

individual demands. Under the consumer interview method, either all consumers or selected few are interviewed. When all the consumers are interviewed, the method is known as complete enumeration method. When only a selected group of consumers are interviewed, it is known as sample survey method

Advantages

1. **I**t is a simple method because it is not based on past record.
2. It suitable for industrial products.
3. The results are likely to be more accurate.
4. This method can be used for forecasting the demand of a new product.

Disadvantages

1. It is expensive and time consuming.
2. Consumers may not give their secrets or buying plans.
3. This method is not suitable for long term forecasting.
4. It is not suitable when the number of consumer is large.

(b)Collective opinion method: Under this method the salesmen estimate the expected sales in their respective territories on the basis of previous experience. Then demand is estimated after combining the individual forecasts (sales estimates) of the salesmen.

This method is also known as sales force opinion method.

Advantages

This method is simple.

1. It is based on the first hand knowledge of Salesmen.
2. This method is particularly useful for estimating demand of new products.
3. It utilises the specialised knowledge of salesmen who are in close touch with the prevailing market conditions.

Disadvantages

1. The forecasts may not be reliable if the salespeople are not trained.
2. It is not suitable for long period estimation.
3. It is not flexible.

86

4. Salesmen may give lower estimates that make possible easy achievement of sales quotas fixed for each salesman.

(c)Experts' opinion method: This method was originally developed at Rand Corporation in 1950 by Olaf Helmer, Dalkey and Gordon. Under this method, demand is estimated on the basis of opinions of experts and distributors other than salesmen and ordinary consumers. This method is also known as Delphi method. Delphi is the ancient Greek temple where people come and prey for information about their future.

Advantages

1. Forecast can be made quickly and economically
2. This is a reliable method because estimates are made on the basis of knowledge and experience of sales experts.
3. The firm need not spare its time on preparing estimates of demand.
4. This method is suitable for new products.

Disadvantages

1. This method is expensive.
2. This method sometimes lacks reliability

(d)Consumer clinics: In this method some selected buyers are given certain amounts of money and asked to buy the products. Then the prices are changed and the consumers are asked to make fresh purchases with the given money. In this way the consumers" responses to price changes are observed. Thus the behaviour of the consumers is studied. On this basis demand is estimated. This method is an improvement over consumer's interview method.

Merits

1. It provides an opportunity to study the behaviour of consumers directly.
2. It provides reliable and realistic picture about future demand.
3. It gives useful information to aid   in the decision making process.

Demerits

87

1. It is a time consuming method.

2. Selecting the participants is very difficult.

3. It is expensive.

4. Consumers may take it as a game. They may not reveal their preferences.

(e) End use method: This method is based on the fact that a product generally has different uses. In the end use method, first a list of end users (final consumers, individual industries, exporters etc.) is prepared. Then the future demand for the product is found either directly from the end users or indirectly by estimating their future growth. Then the demand of all end users of the product is added to get the total demand for the product.

Statistical Methods

Statistical methods use the past data as a guide for knowing the level of future demand. Statistical methods are generally used for long run forecasting. These methods are used for established products. Statistical methods include: (i) Trend projection method, (ii) Regression and Correlation, (iii) Extrapolation method, (iv) Simultaneous equation method, and (v) Barometric method.

(i)Trend projection method: Future sales are based on the past sales, because future is the grand-child of the past and child of the present. Under the trend projection method demand is estimated on the basis of analysis of past data. This method makes use of time series (data over a period of time). We try to ascertain the trend in the time series. The trend in the time series can be estimated by using any one of the following four methods: (a) Least-square method, (b) Free-hand method, (c) Moving average method and (d) semi-average method.

(ii) Regression and Correlation: These methods combine economic theory and statistical technique of estimation. Under these methods the relationship between the sales (dependent variable) and other variables (independent variables such as price of related goods, income, advertisement etc.) is ascertained. Such relationship established on the basis of past data may be used to analyse the future trend. The regression and correlation analysis is also called the econometric model building.

(iii) Extrapolation: Under this statistical method, the future demand can be extrapolated by applying Binomial expansion method. This method is used on the assumption that the rate of charge in demand in the past has been uniform.

(iv) Simultaneous equation method.-This involves the development of a complete econometric model which can explain the behaviour of all the variables which the company can control. This method is not very popular.

(v) Barometric technique: This is an improvement over the trend projection method. According to this technique the events of the present can be used to predict the directions of change m the future. Here certain economic and statistical indicators from the selected time series are used to predict variables. Personal income, non-agricultural placements, gross national income, prices of industrial materials, wholesale commodity prices, industrial production, bank deposits etc. are some of the most commonly used indicators.

Advantages of Statistical Methods

1   The method of estimation is scientific

2   Estimation is based on the theoretical relationship between sales (dependent variable) and price, advertising, income etc. (independent variables)

3   These are less expensive.

4   Results are relatively more reliable.

Disadvantages of Statistical Methods

1   These methods involve complicated calculations.

2   These do not rely much on personal skill and experience.

3   These methods require considerable technical skill and experience in order to be effective.

9.6 Methods of Demand Forecasting for New Products

Demand forecasting of new product is more difficult than forecasting for existing product. The reason is that the product is not available. Hence, no historical data are available. In these conditions the forecasting is to be done by taking into consideration the inclination and wishes of the customers to purchase. For this a research is to be conducted. But there is one problem that it is difficult for a customer to say anything without seeing and using the product before. Thus it is very difficult to forecast the

demand for new products. Any way Prof. Joel Dean has suggested the following methods for forecasting demand of new products:

1. Evolutionary approach: This method is based on the assumption that the new product is the improvement and evolution of the old product. The demand is forecasted on the basis of the demand of the old product. For example, the demand for black and white TV should be taken in to consideration while forecasting the demand for colour TV sets because the latter is an improvement of the former.

2. Substitute approach: Here the new product is treated as a substitute of an existing product, e.g. polythene bags for cloth bags. Thus the demand for a new product is analysed as a substitute for some existing goods or service.

3. Growth curve approach: Under this method the growth rate of demand of a new product is estimated on the basis of the growth rate of demand of an existing product. Suppose Pears soap is in use and a new cosmetic is to be introduced in the market. In this case the average sale of Pears soap will give an idea as to how the new cosmetic will be accepted by the consumers.

4. Opinion poll approach: Under this method the demand for a new product is estimated on the basis of information collected from the direct interviews (survey) with consumers.

5. Sales Experience approach: Under this method, the new product is offered for sale in a sample market, i.e. by direct mail or through multiple shop or departmental shop. From this the total demand is estimated for the whole market.

6. Vicarious approach: This method consists of surveying consumers' reactions through the specialised dealers who are in touch with consumers. The dealers are able to know as to how the customers will accept the new product. On the basis of their reports demand can be estimated.

The above methods are not mutually exclusive. It is de desirable to use a combination of two or more methods in order to get better results.

9.7 LET US SUM UP

In this lesson we have studied the meaning of demand forecasting and identified the short and long term objectives of demand forecasting. As a last part of this lesson we

have looked into the forecasting techniques used by firms to predict the level of demand for their established and new products.

9.8 LESSON – END ACTIVITIES

1. What is demand forecasting and How do you estimate demand for a new product?

2. List out the objectives of demand forecasting

3. Explain the Survey methods of demand forecasting

4. List out the statistical methods used in demand forecasting and discuss the pros and cons of them

5. what are the steps to be followed in forecasting the demand for a product?

9.9 REFERENCES

1. Spencer and Siegeman's "Managerial Economics.

2. Sankaran, Business Economics.

3. Mithani D.M., and Murthy, V.S.R., "Fundamentals of Business Economics.

Lesson: 10 – CONSUMER SURPLUS

CONTENTS

10.0 Aims and Objectives

10.1 Introduction

10.2 Consumer Surplus

10.3 Measurement of Consumer Surplus

10.4 Limitations

10.5 Let us sum up

10.6 Lesson-end activities

10.7 Business Economics

10.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To understand the concept of consumer surplus
- To illustrate the measurement of consumer's surplus
- To list the limitations of consumer's surplus

10.1 INTRODUCTION

The concept of consumer's surplus was evolved by Alfred Marshall. This concept occupies an important place not only in economic theory but also in economic policies of government and decision-making of monopolists.

It has been seen that consumers generally are ready to pay more for the goods than they actually pay for them. This extra satisfaction which consumers get from their purchase of goods is called by Marshall as consumer's surplus.

10.2 CONSUMER'S SURPLUS

Marshall defined the concept of consumer's surplus as "excess of the price which a consumer would be willing to pay rather than go without a thing over that which he actually does pay, is the economic measure of this surplus satisfaction   it   may   be called consumer's surplus".

Thus consumer's surplus = what a consumer is ready to pay - What he actually pays.

The concept of consumer's surplus is derived from the law of diminishing marginal utility. As we know from the law of diminishing marginal utility, the more of a thing we have, the lesser marginal utility it has. In other words, as we purchase more of a good, its marginal utility goes on diminishing. The consumer is in equilibrium when marginal utility is equal to given price i.e., he purchases that many number of units of a good at which marginal utility is equal to price (It is assumed that perfect competition prevails in the market). Since the price is fixed for all the units of the good he purchases except for the one at margin, he gets extra utility; this extra utility or extra surplus for the consumer is called consumer's surplus.

10.3 MEASUREMENT OF CONSUMER's SURPLUS

Consider Table 4 in which we have illustrated the measurement of consumer's surplus in case of commodity X. The price of X is assumed to be Rs. 20.

Table - 4

Measurement of Consumer's Surplus

No. of units	Marginal Utility	Price (Rs.)	Consumer's Surplus
1	30	20	10
2	28	20	8
3	26	20	6
4	24	20	4
5	22	20	2
6	20	20	0
7	18	20	-

We see from the above table that when consumer's consumption increases from 1 to 2 units, his marginal utility falls from Rs. 30 to Rs. 28. His marginal utility goes on diminishing as he increases his consumption of good X. Since marginal utility for a unit of good indicates the price the consumer is willing to pay for that unit, and since price is assumed to be fixed at Rs. 20, the consumer enjoys a surplus at every unit of purchase above 6 units. Thus when the consumer is purchasing 1 unit of X, the marginal utility is

worth Rs. 30 and price fixed is Rs. 20, thus he is deriving a surplus of Rs. 10. Similarly when he purchases 2 units of X, he enjoys a surplus of Rs. 8 [Rs. 28 - Rs. 20]. This continues and he enjoys consumer's surplus equal to Rs. 6, 4, 2 respectively from 3rd, 4th and 5th unit. When he buys 6 units, he is in equilibrium because here his marginal utility is equal to the market price or he is willing to pay a sum equal to the actual market price. Here he enjoys no surplus. Thus, given the price of Rs. 20 per unit, the total surplus which the consumer will get, is Rs. $10 + 8 + 6 + 4 + 2 + 0 = 30$.

The concept of consumer's surplus can also be illustrated graphically. Consider figure 28. On the X-axis is measured the amount of the commodity and on the Y-axis the marginal utility and the price of the commodity. MU is the marginal utility curve which slopes downwards, indicating that as the consumer buys more units of the commodity, its marginal utility falls. Marginal utility shows the price which a person is willing to pay for the different units rather than go without them. If OP is the price that prevails in the market, then consumer will be in equilibrium when he buys OQ units of the commodity, since at OQ units, marginal utility is equal to the given price OP The last unit, i.e., Qth unit does not yield any consumer's surplus because here price paid is equal to the marginal utility of the Qth unit. But for units before Qth unit, marginal utility is greater than the price and thus these units fetch consumer's surplus to the consumer.

Fig. 28 : Marshall's Measure of Consumer's Surplus In Figure 28, the total utility is equal to the area under the marginal utility curve up to point Q i.e. ODRQ. But given the price equal to OP, the consumer actually pays OPRQ. The consumer derives extra utility equal to DPR which is nothing but consumer's surplus.
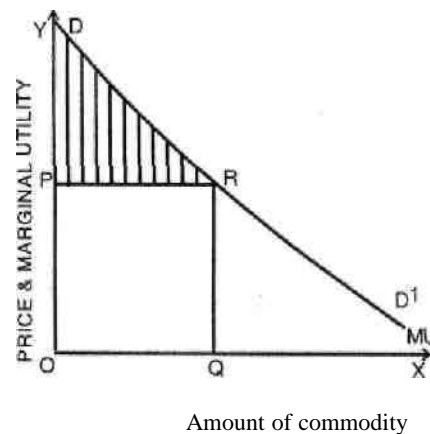

Amount of commodity

94

Fig. 28: Marshall's Measure of Consumer's Surplus

10.4 Limitations:

(1)   Consumer's surplus cannot be measured precisely - because it is difficult to measure the marginal utilities of different units of a commodity consumed by a person.

(2)   In the case of necessaries, the marginal utilities of the earlier units are infinitely large. In such case the consumer's surplus is always infinite.

(3)   The consumer's surplus derived from a commodity is affected by the availability of substitutes.

(4)   There is no simple rule for deriving the utility scale of articles which are used for their prestige value (e.g., diamonds).

(5)   Consumer's surplus cannot be measured in terms of money because the marginal utility of money changes as purchases are made and the consumer's stock of money diminishes. (Marshall assumed that the marginal utility of money remains constant. But this assumption is unrealistic).

(6)   The concept can be accepted only if it is assumed that utility can be measured in terms of money or otherwise. Many modern economists believe that this cannot be done.

10.5 LET US SUM UP

In this lesson a new concept called Marshall's Consumer surplus is introduced. We also studied the way by which consumer's surplus could be measured through an illustration. We also studied the various limitations of consumer's surplus.

10.6 LESSON – END ACTIVITIES

1. Illustrate the concept of consumer surplus

2. Bring out the limitations of consumer surplus.

10.7 REFERENCES

1. Mithani, D.M., and Murthy, V.S.R., "Fundamentals of Business Economics.

2. Sankaran, Business Economics.

UNIT - III

COST CONCEPTS AND PRODUCTION FUNCTION

Lesson: 11 - COST CONCEPTS

CONTENTS

11.0 Aims and Objectives

11.1 Introduction

11.2 Various Cost Concepts

11.3 Let us sum up

11.4 Lesson –end activities

11.5 References

11.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To familiarize the cost concept used in managerial decision making process.
- To understand about the various costs

11.1 INTRODUCTION

The word 'cost' has different meanings in different situations. The accounting cost concept or the historical cost concept is not useful as such for business decision-making. The accounting records end up with the balance sheet and income statements which are meant for legal, financial and tax needs of the enterprise. The financial recordings reveal what has been happening. It is a historical recording which is not of very much help to the managerial economist in his business decision-making. The actual cost is not the relevant cost concept for business decision-making because it only reveals what has been happening. The decision-making concepts of cost aim at projecting what will happen in the alternative courses of action. Business decisions involve plans for the future and require choices among different plans. These decisions necessitate profitability calculations for which a comparison of future revenues and future expenses of each alternative plan is needed.

11.2 Various Concepts of Costs

A managerial economist must have a proper understanding of the different cost concepts which are essential for clear business thinking. The several alternative bases of classifying cost and the relevance of each for different kinds of problems are to be studied. The various relevant concepts of costs used in business decisions are given below.

Total, Average and Marginal Costs

Total cost is the total cash payment made for the input needed for production. It may be explicit or implicit is the sum total of the fixed and variable costs.

Average cost is the cost per unit of output. It is obtained by dividing the total cost (TC) by the total quantity produced (Q)

$$\text{Average Cost} \quad = \quad \frac{TC}{Q}$$

Marginal cost is the additional cost incurred to produce an additional unit of output. Or it is the cost of the marginal unit produced.

Example

A company produces 1000 typewriters per annum. Total fixed cost is Rs. 1,00,000 per annum. Direct material cost per typewriter is Rs. 200 and direct labour cost Rs. 100.

Variable cost per typewriter = direct material + direct labour

$$= 200 + 100 = \text{Rs. } 300$$

Total variable cost (1000x300) = Rs.300000

Fixed Cost = Rs. 100000

Total cost = Rs.400000

TC = Rs. 400000

$$\text{Average Cost} \quad = \frac{TC}{Q} \quad = \quad \frac{400000}{1000} \quad = \text{Rs. } 400$$

If output is increased by one typewriter, the cost will appear as follows:

Total variable cost (1001x300) = 300300

Fixed cost = 100000

Total   =   400300

Here the additional cost incurred to produce the 1001th typewriter is Rs.300 (400300 - 400000). Therefore, the marginal cost per typewriter is Rs.300.

Fixed and Variable Costs

This classification is made on the basis of the degree to which they vary with the changes in volume. Fixed cost is that cost which remains constant up to a certain level of output. It is not affected by the changes in the volume of production. Then fixed cost per unit aries with output rate. When the production increases, fixed cost per unit decreases. Fixed cost includes salary paid to administrative staff, depreciation of fixed assets, rent of factory etc. These costs are fixed in the sense that they do not change in short-run.

Variable cost varies directly with the variation in output. An increase in total output results in an increase in total variable costs and decrease in total output results in a proportionate decline in the total variable costs. The variable cost per unit will be constant. Variable costs include the costs of all inputs that vary with output like raw materials, running costs of fixed assets such as fuel, ordinary repairs, routine maintenance expenditure, direct labour charges etc.

The distinction of cost is important in forecasting the effect of short-run changes in volume upon costs and profits.

Short-Run and Long-Run Costs

This cost distinction is based on the time element. Short-Run is a period during which the physical capacity of the firm remains fixed. Any increase in output during this period is possible only by using the existing physical capacity more intensively. Long-Run is a period during which it is possible to change the firm's physical capacity. All the inputs become variable in the long-term. Short-Run cost is that which varies with output when the physical I capacity remains constant. Long-Run costs are those which vary with output when all the inputs are variable. Short-Run costs are otherwise called variable costs. A firm wishing to change output quickly can do it only by increasing the variable factors. Short- Run cost concept helps the manager to take decision when a firm has to decide whether or not to produce more or less with a given plant. Long-Run cost analysis

helps to take investment decisions. Long-Run increase in output may necessitate installation of more capital equipment.

Opportunity Costs and Outlay Costs

This distinction is made on the basis of the nature of the sacrifice made. Outlay costs are those expenses which are actually incurred by the firm. These are the actual payments made for labour, material, plant, building, machinery, traveling, transporting etc. These are the expense items that appear in the books of accounts. Outlay cost is an accounting cost concept. It is also called absolute cost or actual cost. Whenever the inputs are to be bought for cash the outlay concept is to be applied.

A businessman chooses and investment proposal from different investment opportunities. Before taking the decision he has to compare all the opportunities and choose the best. When he chooses the best he sacrifices the possibility of making profit from other investment opportunities. The cost of his choice is the return that he could have earned from other investment opportunities he has given up or sacrificed. A businessman decides to use his own money to buy a machine for the business. The cost of that money is the probable return on the money from the next most acceptable alternative investment. If he invested the money at 12 percent interest, the opportunity cost of investing in his own business would be the 12 percent interest he has forgone.

The outlay concept is applied when the inputs are to be bought from the market. When a firm decides to make the inputs rather than buying it from the market the opportunity cost concept is to be applied. For example, in a cloth mill, instead' of buying the yarn from the market they spin it themselves. The cost of this yam is really the price at which the yarn could be sold if it were not used by them for weaving cloth.

The opportunity cost concept is made use of for long-run decisions. For example, the cost of higher education of a student should not only be the tuition fees and book costs but it also includes the earnings foregone by not working. This concept is very important in capital expenditure budgeting. The cost of acquiring a petrol pump in

Trivandrum City by spending Rs. 6 lakhs is not usually the interest for that borrowed money but it is the profit that would have been made if that Rs. 6 lakhs had been invested in an offset printing press, which is the next best investment opportunity.

Opportunity cost concept is useful for taking short-rum decisions also. In boom periods the scarce lathe capacity used for making a product involves the opportunity cost of not using it to make some other product that can also produce profit. Opportunity cost is the cost concept to use when the supply of inputs is strictly limited. Estimates of cost of capital are essentially founded on an opportunity cost concept of investment return. Investment decision involves opportunity costs measurable in terms of sacrificed income from alternative investments. The opportunity cost of any action is therefore measured by the value of the most favorable alternative course which has to be foregone if that action is taken.

Opportunity cost arises only when there is an alternative. If there is no alternative, opportunity cost is the estimated earnings of the next best use. Thus it represents only the sacrificed alternative.

Hence it does not appear in financial accounts. But this concept is of very great use in managerial decision-making.

Out-of-pocket and Book Costs

Out-of-pocket costs are those costs that involve current cash payment. Wages, rent, interest etc., are examples of this. The out-of-pocket costs are also called explicit costs. Book costs do not require current cash expenditure. Unpaid salary of the owner manager, depreciation, and unpaid interest cost of owner's own fund are examples of book costs. Book costs may be called implicit costs. But the book costs are taken into account in determining the legal dividend payable during a period. Both book costs and out-of-pocket costs are considered for all decisions. Book cost is the cost of self owned factors of production. The book cost can be converted into out-of-pocket cost. If a self-owned machinery is sold out and the service of the same is hired, the hiring charges form the out-of-pocket cost The distinction is very helpful in taking liquidity decisions.

Incremental and Sunk costs

100

Incremental cost is the additional cost due to a change in the level or nature of business activity. The change may be caused by adding a new product, adding new machinery, replacing machinery by a better one etc. Incremental or differential cost is not marginal cost. Marginal cost is the cost of an added (marginal) unit of output.

Sunk costs are those which are not altered by any change. They are the costs incurred in the past. This cost is the result of past decision, and cannot be changed by future decisions. Once an asset has been bought or an investment made, the funds locked up represent sunk costs. As these costs do not alter when any change in activity is made they are sunk and are irrelevant to a decision being taken now. Investments in fixed assets are examples of sunk costs. As soon as fixed assets have been installed, their cost is sunk. The amount of cost cannot be changed.

Incremental cost helps management to evaluate the alternatives. Incremental cost will be different in the case of different alternatives. Sunk cost, on the other hand, will remain the same irrespective of the alternative selected. Cost estimates of an incremental nature only influence business decisions.

Explicit and Implicit or Imputed costs

Explicit costs are those expenses that involve cash payments. These are the actual or business costs that appear in the books of accounts. Explicit cost is the payment made by the employer for those factors of production hired by him from outside. These costs include wages and salaries paid payments for raw materials, interest on borrowed capital funds, rent on hired land, taxes paid to the government etc.

Implicit costs are the costs of the factor units that are owned by the employer himself. It does not involve dash payment and hence does not appear in the books of accounts. These costs did not actually incur but would have incurred in the absence of employment of self-owned factors of production. The two normal implicit costs are depreciation and return on capital contributed by shareholders. In small scale business unit the entrepreneur himself acts as the manager of the business. If he were employed in another firm he would be given salary. The salary he has thus forgone is the opportunity cost of his services utilised in his own firm. This is an implicit cost of his business. Thus

implicit wages, implicit rent and implicit interest are the highest interest, rent and wages which self-owned capital, building and labour respectively can earn from their next best use. Implicit costs are not considered for finding out the loss or gains of the business, but help a lot in business decisions.

Replacement and Historical costs

These are the two methods of valuing assets for balance sheet purpose and to find out the cost figures from which profit can be arrived at; Historical cost is the original cost of an asset. Historical cost valuation shows the cost of an asset as the original price paid for the asset acquired in the past. Historical valuation is the basis for financial accounts. Replacement cost is the price that would have to be paid currently to replace the same asset. For example, the price of a machine at the time of purchase was Rs. 17,000 and the present price of the machine is Rs. 20,000. The original price Rs. 17,000 is the historical cost while Rs. 20,000 is the replacement cost. During periods of substantial change in the price level, historical valuation gives a poor projection of the future cost intended for managerial decision. Replacement cost is a relevant cost concept when financial statements have to be adjusted for inflation.

Controllable and Non-controllable costs

Controllable costs are the ones which can be regulated by the executive who is in charge of it. The concept of controllability of cost varies with levels of management. If a cost is uncontrollable at one level of management it may be controllable at some other level. Similarly the controllability of certain costs may be shared by two or more executives. For example, material cost, the price of which comes under the responsibility of the purchase executive whereas its usage comes under the responsibility of the production executive. Direct expenses like material, labour etc. are controllable costs.

Some costs are not directly identifiable with a process or product. They are apportioned to various processes or products in some proportion. This cost varies with the

102

variation in the basis of allocation and is independent of the actions of the executive of that department. These apportioned costs are called uncontrollable costs.

Business and Full costs

A firm's business cost is the total money expenses recorded in the books of accounts. This includes the depreciation provided on plant and equipment. It is similar to the actual or real cost. Full cost of a firm includes not only the business costs but also opportunity costs of the firm and normal profits. The firm's opportunity cost includes interest on self-owned capital, the salary forgone by the entrepreneur if he were, working in his firm. Normal profit is the minimum returns which induces the entrepreneur to produce the same product.

Economic and Accounting Cost

Accounting costs are recorded with the intention of preparing the balance sheet and profit and loss statements which are intended for the legal, financial and tax purposes of the company. The accounting concept is a historical concept. It records what has happened. The past cost data revealed by the books of accounts does not help very much in decision-making. Decision-making needs future costs. Economic concept considers future costs and future revenues which help future planning and choice. When the accountant describes what has happened, the economist aims at projecting what will happen. Accounting data ignores implicit. or imputed cost. The economist considers decision-making costs. For this, different cost classifications relevant to different kinds of problems are considered. The cost distinctions such as opportunity and outlay cost, short-run and long-run cost and replacement and historical cost are made from the economic viewpoint.

11.3 LET US SUM UP

103

In this lesson initially we studied the meaning of cost, and a detailed discussion has been made into various concepts of costs such as total cost, average cost, marginal cost, fixed cost, variable cost; short run and long run cost, opportunity cost, out lay cost, book costs, such cost, incremental cost, explicit and implicit cost historical cost replacement cost, controllable abnormal controllable cost, business and full cost, economic cost, and according cost.

11.4 LESSON – END ACTIVITIES

1. Mention the importance of opportunity cost in managerial decision making

2. Bring out the relationship between TC, MC, and AC

3. Differentiate Explicit and Implicit cost

4. Distinguish between Incremental cost and sunk cost

11.5 REFERENCES

1. Mehta, P.L. "Managerial Economics 'Analysis, Problems & Cases', Sultan Chand & Sons.

2. Sundharam, K.P.M. and Sundharam E.N. "Business Economics.

Lesson: 12 – COST-OUTPUT RELATIONS

CONTENTS

12.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To understand the concept of cost-output relations
- To know the important role of cost-output relationship in determining the optimum level of production.
- To know and analyse the movement of costs both in short run and long run

12.1 Cost-Output Relations

The cost-output relationship plays an important role in determining the optimum level of production. Knowledge of the cost-output relation helps the manager in cost control, profit prediction, pricing, promotion etc. The relation between cost and output is technically described as the cost function.

TC $=$ $f(Q)$

Where

TC $=$ Total cost

Q $=$ Quantity produced

F $=$ function

The production function combined with the prices of inputs determines the cost function of the firm. Considering the period the cost function can be classified as (a) short-run cost function and (b) long run-cost function.

In economic theory, the short-run is defined as that period during which the physical capacity of the firm is fixed, and during which output can be increased only by using the existing capacity more intensively. The long-run is a period during which it is possible to increase the firm's capacity or to reduce it in size, if trade is very bad.

12.2 Short-run Cost-Output Relation

The cost concepts made use of in the cost behavior are total cost, average cost and marginal cost. Total cost if the actual money spent to produce a particular quantity of output. It is the summation of fixed and variable costs.

$$TC \quad = \quad TFC + TVC$$

Upto a certain level of production total fixed cost, i.e. the cost of plant, building, equipment etc. remains fixed. But the total variable costs i.e., the cost of labour, raw materials etc. vary with the variation in output

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

Or it is the total of average fixed cost (TFC / Q) and average variable cost (TVC/Q)

Marginal cost is the addition to the total cost due to the production of an additional unit of product. Or it is the cost of the marginal unit produced. It can be arrived at by dividing the change in total cost by the change in total output.

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

In the short-run there will not be any change in total fixed cost. Hence change in total cost implies change in total variable cost only.

107

Short-run Cost-Output Relations

Units of output Q	Total Fixed cost TFC	Total variable cost	Total cost TC (2+3)	Average variable cost AVC 3/1	Average fixed cost AFC 2/1	Average cost (5+6) AC	Marginal cost MC
1	2	3	4	5	6	7	8
0	60	-	60	-	-	-	-
1	60	20	80	20	60	80	20
2	60	36	96	18	30	48	16
3	60	48	108	16	20	36	12
4	60	64	124	16	15	31	16
5	60	90	150	18	12	30	26
6	60	132	192	22	10	32	42

Table 1

Table 1 represents the cost-output relation. The table is prepared on the basis of the Law of Diminishing Marginal Returns. The fixed cost Rs.60 may include rent of factory building, interest on capital, salaries of permanently employed staff, insurance etc. These fixed costs are independent of output, whose amount cannot be altered in the short-run. But the average fixed cost, i.e. the fixed cost per unit, falls continuously as the out put increase. The greater the out put, lower the fixed cost per unit. The total variable cost (TVC) increases but not at the same rate. If more and more units are produced with a given physical capacity AVC will fall initially. AVC declines upto 3rd unit, it is constant upto 4th unit and then rises. This is because the efficiency first increases and then decreases. The variable factors seem to produce somewhat more efficiently near a firm's optimum capacity output level than at very low levels of output. But once the optimum capacity is reached, any further increase in output will increase AVC.
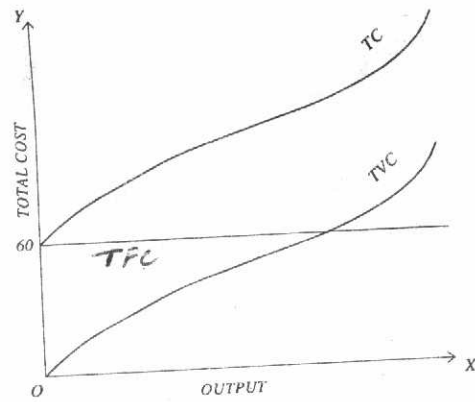
Fig. 1

The average total cost (AC) declines first and then rises. The rise in AC is felt only after the AVC starts rising. In the table AVC starts rising from the 5th unit onwards whereas the AC starts rising from the 6th unit only. AFC continues to fall with increase in output. But AVC initially declines and then rises. Thus there will be a stage where the AVC may have started rising, yet AC is still declining because the rise in AVC is less than the drop in AFC, the net effect being a decline in AC. Thus the table A shows an increasing returns or diminishing cost in the first instance and eventually diminishing returns or increasing cost.

The short-run cost-output relationship can be shown graphically also. Fig.1 shows the relationship between output and total fixed cost, total variable cost and total cost. TFC curve is a horizontal straight line representing Rs.60, whatever be the output TVC curve slopes upward starting from zero, first gradually but later at a fast rate. TC = TFC+TVC. As TFC remains constant, increase in TC means increase in TVC only. As TFC remains constant the gap between TVC and TC will always be the same. Hence TC curve has the same pattern of behaviour as TVC curve.
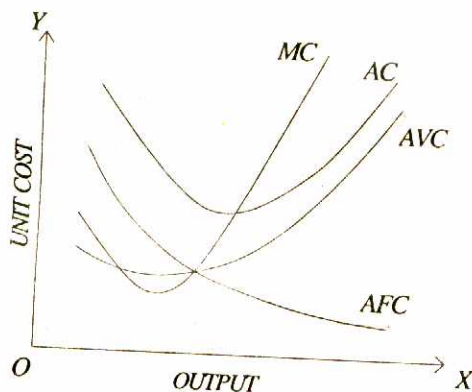
Fig. 2

Fig.2 shows the law of production more clearly. AFC curve continues to fall as output rises from lower levels to higher levels. This is because the total fixed cost is spread over more and more units as output increases. TVC increases with the increase in production since more raw materials, labour, power etc. would be required for increasing output. But AVC curve (i.e.variable cost per unit) first falls and then rises. This is due to the operation of the law of variable proportions.

The behaviour of AC curve depends upon the behaviour of AVC curve and AFC curve. In the initial stage of production both AFC and AVC are declining. Hence AC also declines. AFC continues to fall with an increase in output while AVC first declines and then rises. So long as AFC and AVC decline AC will also decline. But after a certain point AVC starts rising. If the rise in AVC is less than the decline in AFC, AC will still continue to decline. When the rise in AVC is more than the drop in AFC, AC begins to rise. In the table we can see that when the production is increased to 5 units AVC increases but AC still declines. Here the increase in AVC is less than the decline in AFC, the net effect being a decline in AC. AC curve, thus declines first and then rises.

At first AC is high due to large fixed cost. As output increases the total fixed cost is shared by more and more units and hence AC falls. After a certain point, owing to the operation of the law of diminishing marginal returns, the variable cost and, therefore, AC

110

starts increasing. The lower end of AC curve thus turns up. and gives it a U-shape. That is why AC curves are U-shaped. The least-cost combination of inputs is indicated by the lowest point in Ac curve i.e. where where the total average cost is the minimum. It is the short-run stage of optimum output. It may not be the maximum output level. It is the point where the per unit cost of production will be at its lowest.

A downward trend in MC curve shows increasing marginal productivity (i.e.decreasing marginal cost) of the variable input. Similarly, an upward trend in MC curve shows the rate of increase in TVC, on the one hand and the decreasing marginal productivity (i.e. increasing marginal cost) of the variable input on the other. MC curve intersects both AVC and AC curves at their lowest points.

The relationship between AVC, ATC and AFC can be summed up as follows:

1.   If both AFC and AVC fall, AC will also fall because AC=AFC+AVC

2.   When AFC falls and AVC rises(a) AC will fall where the drop in AFC is more than the rise in AVC (b) AC remains constant if the drop in AFC=rise in AVC (c) AC will rise where the drop in AFC is less than the rise in AVC.

12.3 Long-Run Cost-Output Relations

Long-run is a period long enough to make all inputs variable. In the long-run a firm can increase or decrease its output according to its demand, by having more or less of all the factors of production. The firms are able to expand the scale of their operation in the long-run by purchasing larger quantities of all the inputs. Thus in the long-run all factors become variable. The long-run cost-output relations therefore imply the relationship between total costs and total output. As the change in production in the long-run is possible by changing the scale of production, the long-run cost-output relationship is influenced by the law of returns to scale.

In the long-run a firm has a number of alternatives in regard to the scale of operations. For each scale of production or plant size, the firm has a separate short-run average cost curve. Hence the long-run average cost curve is composed of a series of short-run average cost curves.

A short-run average cost (SAC) curve applies to only one plant whereas the long-run average cost (LAC) curve takes into consideration many plants. At any one time the

firm has only one size of plant. That plant remains fixed during that period. Any increase in production in that period is possible only with that plant capacity. That plant has a corresponding average cost (SAC) curve. But in a long period the firm can move from one plant size to another. Each plant has its corresponding SAC curve.
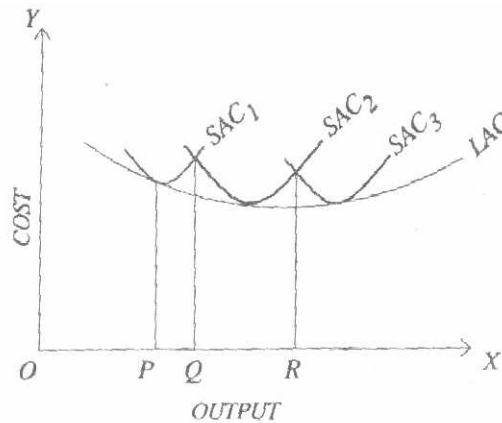

Fig. 3

The long-run cost-output relationship is shown graphically by the LAC curve. To draw an LAC curve we have to start with a number of SAC curves. In the fig. 5.3 we have assumed that there are only three sizes of plants-small, medium and large, S ACj refers to the average cost curve for the small plant, S AC, for the medium size plant and SAC3 for the large size plant. If the firm wants to produce OP units or less, it will choose the small plant. For an output beyond OQ the firm will opt for medium size plant. Even if an increased production is possible with small plant production beyond OQ will increase cost of production per unit. For an output OR the firm will choose the large plant. Thus in the long-run the firm has a series of SAC curves. The LAC curve drawn will be tangential to the three SAC curves i.e. the LAC curve touches each SAC curve at one point. The LAC curve is also known as Envelope Curve as it envelopes all the SAC curves. No point on any of the LAC curve can ever be below the LAC curve. It is also known as Planning Curve as it serves as a guide to the entrepreneur

In his planning the size of plant for future expansion. The plant which yields the lowest average cost of production will be selected. LAC can, therefore, be defined as the

112

lowest possible average cost of producing any output, when the management has adequate I time to make all desirable changes and adjustments.

In the long-run the demand curve of the firm depends on the law of returns to scale. The law of returns to scale states that if a firm increases the quantity of all inputs simultaneously and proportionately, the total output initially increases more than proportionately but eventually increases less than proportionately. It implies that when production increases, per unit cost first' decreases but ultimately increases. This means LAC curve falls initially and rises subsequently. Like SAC curve LAC curve also is U-shaped, but it will be always flatter then SAC curves. The U-shape implies lower and lower average cost in the beginning until the optimum scale of the firm is reached and successively higher average cost thereafter. The increasing return is experienced on account of the economies of scale or advantages of large-scale production Increase in scale makes possible increased division and _pecialization of labour and more efficient use of machines. After a certain point increase in production makes management more difficult and less efficient resulting in less than proportionate increase in output

Long-run Marginal Cost Curve

Fig. 4

113
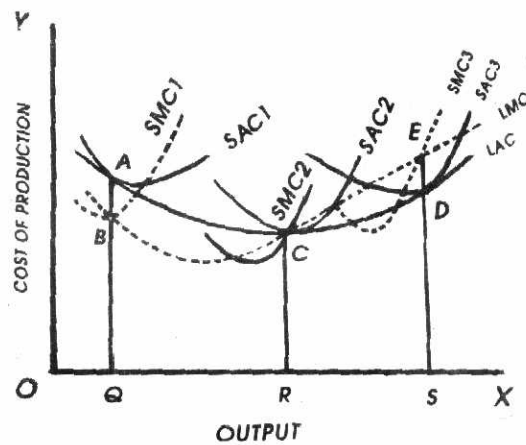
The long-run marginal cost curve represents the cost of an additional unit of output when all the inputs vary. The long-run marginal cost curve (LMC) is derived from the short-run marginal cost (SMC) curves. LMC curve intersects LAC curve at its minimum point C. There is only one plant size whose minimum SAC coincides with the minimum LAC and LMC.

$SAC_2 = SMC_2 = LAC = LMC$

The point C indicates also the optimum scale of production of the firm in the long-run or optimum output. Optimum output level is the level of production at which the cost of production per unit, i.e. AC, is the lowest. The optimum level is not the maximum profit level. The optimum point is where AC=MC. Here C is the optimum point.

12.4 LET US SUM UP

It is clear from this lesson that the Cost-Output relationship concept would help the manager in cost control, pricing, profit prediction, promotion etc. We also discussed about the movement of cost in short run and long run.

12.5 LESSON END ACTIVITIES

1. Write a note on cost-output relationship

2. Explain the concept of cost output relationship in short run and long run

12.6 REFERENCES

1.Reddy P.N. and Appanniah, HR "Principles of Business Economics.

2.Adhikary, M. "Managerial Economics.

Lesson: 13-PRODUCTION ANALYSIS

CONTENTS

13.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To understand the meaning of Production
- To Know the factors and characteristics of Production
- To familiarize the basic concepts in production theory
- To understand the production function

13.1 INTRODUCTION

Production is an important economic activity. It directly or indirectly satisfies the wants and needs of the people. Satisfaction of human wants is the objective of production. In this lesson a general discussion of the concept of production and its functions are carried out.

115

13.2 Meaning of Production

Production is the conversion of input into output. The factors of production and all other things which the producer buys to carry out production are called input. The goods and services produced are known as output. Thus production is the activity that creates or adds utility and value. In the words of Fraser, "If consuming means extracting utility from matter, producing means creating utility into matter". According to Edwood Buffa, "Production is a process by which goods and services are created"

13.3 Factors of Production

As already stated, production is a process of transformation of factors of production (input) into goods and services (output). The factors of production may be defined as resources which help the firms to produce goods or services. In other words, the resources required to produce a given product are called factors of production. Production is done by combining the various factors of production. Land, labour, capital and organisation (or entrepreneurship) are the factors of production (according to Marshall). We can use the word CELL to help us remember the four factors of production: C. capital; Entrepreneurship; L land: and L labour.

13.4 Characteristics of Factors of Production

1.   The ownership of the factors of production is vested in the households.

2.   There is a basic distinction between factors of production and factor services. It is these factor services, which are combined in the process of production.

3.   The different units of a factor of production are not homogeneous. For example, different plots of land have different level of fertility. Similarly labourers differ in efficiency.

4.   Factors of production are complementary. This means their co-operation or combination is necessary for production.

5.   There is some degree of substitutability between factors of production. For example, labour can be substituted for capital to a certain extent.

116

13.5 Basic Concepts in Production Theory

The firm is an organisation that combines and organises labour, capital and land or raw materials for the purpose of producing goods and services for sale. The aim of the firm is to maximise total profits or achieve some other related aim, such as maximising sales or growth. The basic production decision facing the firm is how much of the commodity or services to produce and how much labour, capital and other resources or inputs to use to produce that output most efficiently. To answer these questions, the firm requires engineering or technological data on production possibilities (the so called production function) as well as economic data on input and output prices.

Production refers to the transformation of inputs or resources into outputs of goods and services. For example: IBM hires workers to use machinery, parts and raw materials in factories to produce personal computers. The output of a firm can either be a final commodity (such as personal computer) or an intermediate product such as semiconductors (which are used in the production of computers and other goods). The output can also be a service rather than a good. Examples of services are education, medicine, banking, communication, transportation and many others. To be noted is, that production refers to all of the activities involved in the production of goods and services, from borrowing to set up or expand production facilities, to hiring workers, purchasing ra"w materials, running quality control, cost accounting and so on, rather than referring merely to the physical transformation of inputs into outputs of goods and services.

Inputs are the resources used in the production of goods and services. As a convenient way to organise the discussion, inputs are classified into labour. (Including entrepreneurial talent), capital and land or natural resources. Each of these broad categories however includes a great variety of the basic input. For example, labour includes bus drivers, assembly line workers, accountants, lawyers, doctors scientists and many others. Inputs are also classified as fixed or variable. Fixed inputs are those that can not be readily changed during the time period under consideration, except at very great expense. Examples of fixed inputs are the firm's plant and specialised equipment. On the

other land, variable inputs are those that can be varied easily and on the very short notice. Examples of variable inputs are most raw materials and unskilled labour.

The time period during which at least one input is fixed is called the short run, while the time period when all inputs are variable is called the long run. The length of the long run depends on the industry. For some, such as the setting up or expansion of a dry cleaning business, the long run may be only few months or weeks. For others, much as the construction of new electricity, generating plant, it may be many years. In the short run, a firm can increase output only by using more of the variable inputs together with the fixed inputs. In the long run, the same increase in output could very likely be obtained more efficiently by also expanding the firm's production facilities. Thus we say that the firm operates in the short run and plans increases or reductions in its scale of operation in the long run. In the long run, technology usually improves, so that more output can be obtained from a given quantity of inputs or the same output from less input.

13.6 Production Function

Production is the process by which inputs are transformed in to outputs. Thus there is relation between input and output. The functional relationship between input and output is known as production function. The production function states the maximum quantity of output which can be produced from any selected combination of inputs. In other words, it states the minimum quantities of input that are necessary to produce a given quantity of output.

The production function is largely determined by the level of technology. The production function varies with the changes in technology. Whenever technology improves, a new production function comes into existence. Therefore, in the modern times the output depends not only on traditional factors of production but also on the level of technology.

The production function can be expressed in an equation in which the output is the dependent variable and inputs are the independent variables. The equation is expressed as follows:

$$Q = f(L, K, T \ldots \ldots \ldots n)$$

118

Where, Q = output

L = labour

K = capital

T = level of technology

n = other inputs employed in production.

There are two types of production function - short run production function and long run production function. In the short run production function the quantity of only one input varies while all other inputs remain constant. In the long run production function all inputs are variable.

Assumptions of Production Function

The production function is based on the following assumptions.

1. The level of technology remains constant.
2. The firm uses its inputs at maximum level of efficiency.
3. It relates to a particular unit of time.
4. A change in any of the variable factors produces a corresponding change in the output.
5. The inputs are divisible into most viable units.

Managerial Use of Production Function

The production function is of great help to a manager or business economist. The managerial uses of production function are outlined as below:

1. It helps to determine least cost factor combination: The production function is a guide to the entrepreneur to determine the least cost factor combination. Profit can be maximized only by minimizing the cost of production. In order to minimize the cost of production, inputs are to be substituted. The production function helps in substituting the inputs.

2. It helps to determine optimum level of output: The production function helps to determine the optimum level of output from a given quantity of input. In other words, it helps to arrive at the producer's equilibrium.

3. It enables to plan the production: The production function helps the entrepreneur (or management) to plan the production.

4. It helps in decision-making :Production function is very useful to the management to take decisions regarding cost and output. It also helps in cost control and cost reduction. In short, production function helps both in the short run and long run decision-making process.

13.7 Cobb Douglas Production Function

Paul H. Douglas and C.W Cobb of the U.S.A have studied the production of the American manufacturing industries and they formulated a statistical production function. It is popularly known as Cobb-Douglas Production Function. It is stated as follows.

Q = KLaC,,a) where, Q = output

L = quantity of labour

C = quantity of capital

K and a = positive constants

In this production function the output (Q) is a function of two inputs L and C.

According to Cobb Douglas production function, about 3/4 of the increase in output is due to labour and the remaining 1/4 is due to capital. On this basis,

Cobb Douglas production function can be expressed as under:

120

$$Q = KL^{3/4} C^{1/4}$$

$$L+C = \frac{3}{4} + \frac{1}{4} = 1$$

An important point in Cobb Douglas production function is that it indicates constant returns to scale. This means that if each input factor is increased by one percent, output will exactly increase by one percent. In other words, there will be no economies or diseconomies of scale.

Although the Cobb Douglas production function is nonlinear, it can be transformed into a linear function by converting all variables into logarithms. That is why this function is known as a log linear function.

In 1937, David Duerentt suggested that it will be better to present Cobb-Douglas production function in the form of following equation :

$$Q = KL^a C^j$$

In the above equation, 'a' and 'j' stand for elasticity of production of labour and capital respectively.

Importance of Cobb-Douglas Production Function

Cobb-Douglas production function is most commonly used function in the field of economics. It graduates data on output and input well. Many economists used it independently. Hence, there are a number of varieties of the Cobb-Douglas form which yield variable elasticity's of production and substitution. It is useful in international or inter- industry comparisons.

Cobb-Dougla's research has been a test of the marginal productivity theory of wages (or theory of distribution) as well as descriptions of production technology.

13.8 LET US SUM UP

A detailed study is made about the concept of production in this lesson. The initial portion of this lesson explains us the meaning, factors and characteristics of production. We discussed the production function and its managerial uses. An illustration is made on the Cobb-Douglas production function as the last part of this lesson

13.9 LESSON-END ACTIVITIES

      1. What is a production function?

      2. Explain the characteristics of Production

      3. Discuss in detail the Cobb-Douglas Production function

13.10 REFERENCES

      1. Mehtra, P.L. "Managerial Economics" 'Analysis, Problems & Cases', Sultan Chand & Sons.

      2. Mote, V.L. Samuel Paul and G.S. Gupta "Managerial Economics".

      3. Maddala, G.S. and Ellen Miller, Micro Economics: Theory and Applications, McGraw Hill, New York.

Lesson: 14- LAWS OF PRODUCTION

CONTENTS

      14.0 Aims and Objectives

      14.1 Introduction

      14.2 Law of Diminishing Returns

      14.3 Why does the Law of Variable Proportion Operate?

      14.4 Importance of Law of Variable proportion

      14.5 Law of Returns to Scale

      14.6 Production function with two variable inputs

      14.7 Let us sum up

      14.8 Lesson End activities

      14.9 References

14.0 AIMS AND OBJECTIVES

After having studied this lesson, you should be able

- To understand the Laws of Production

  To Know Why the Law of Variable Proportion Operate

- To understand Law of Returns to Scale

14.1 INRODUCTION

Production function shows the relationship between input and output. The law of production shows the relationship between additional input and additional output. The laws of production consists of - **(1) Law of Diminishing Returns** (to analyse production in the short period), and **(2) Laws of Returns to Scale** (to analyse production in the long period).

14.2 Law of Diminishing Returns or Law of Variable Proportion

The law of variable proportion is the modern approach to the 'Law of Diminishing Returns (or The Laws of Returns). This law was first explained by Sir. Edward West (French economist). Adam Smith, Ricardo and Malthus (Classical economists) associated this law with agriculture. This law was the foundation of Recardian Theory of Rent and Malthusian theory of population.

The law of variable proportion shows the production function with one input factor variable while keeping the other input factors constant.

The law of variable proportion states that, if one factor is used more and more (variable), keeping the other factors constant, the total output will increase at an increasing rate in the beginning and then at a diminishing rate and eventually decreases absolutely.

According to K. E. Boulding, "As we increase the quantity of any one input which is combined with a fixed quantity of the other inputs, the marginal physical productivity of the variable input must eventually decline".

In this law we study the effect of variations in factor proportion on output. When one factor varies, the others fixed, the proportion between the fixed factor and the variable factor will vary, (e.g., land and capital will be fixed in the short run, while labour

123

will be variable).That is why the law is called the law of variable proportion. **The law of variable proportion is also known as the law of proportionality, the law of diminishing returns, law of non-proportional outputs etc.**

The following table illustrates the operations of Law of Variable Proportion.

Table - 2

No. Of workers (Variable Input factor)	Total Product (TP)	Average Product (AP)	Marginal Product (MP)	Remarks
1	10	10	10	I Stage
2	24	12	14	I Stage
3	39	13	15	I Stage
4	56	14	17	I Stage
5	70	14	14	II Stage
6	78	13	8	II Stage
7	84	12	6	II Stage
8	84	10.5	0	II Stage
9	81	9	-3	III Stage

In the above table we can see that both the average and marginal products increase at first and then decline. Average product is the product for one unit of labour. It is calculated by dividing the total product by the number of workers. Marginal product is the additional product resulting from additional labour. The total product increases at an increasing rate till the employment of the 4th worker. Beyond the 4th worker, the marginal product is diminishing. The marginal product declines faster than the average product. When 7 workers are employed, the total product is maximum. For 8 workers marginal product is zero and the marginal product of 9 workers is negative. Thus when more and more units labour are combined with other fixed factors, the total product increases first at an increasing rate, then at a diminishing rate and finally it becomes negative.

The above idea can be more clearly illustrated with the help of a diagram (Fig.5).
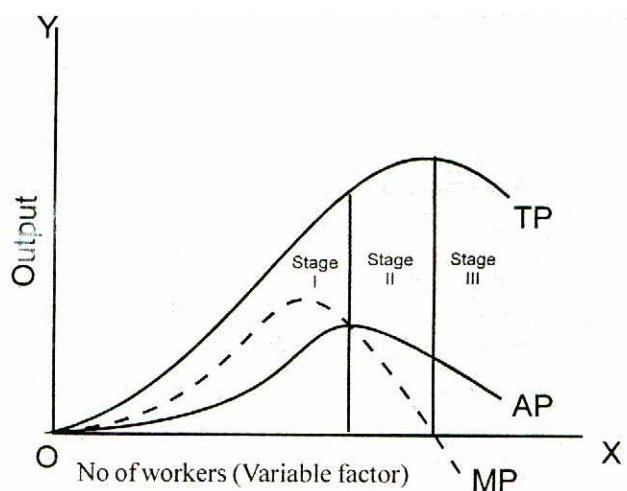
Fig. 5

When one input is variable and others are held constant, the relations between the input and the output are divided into three stages. The law of variable proportion may be explained under the following three stages as shown in the graph:

Stage 1: Total product increases at an increasing rate and this continues till the end of this stage. Average product also increases and reaches its highest point at the end of this stage. Marginal product increases at an increasing rate. Thus TP, AP and MP - all are increasing. Hence this stage is known as stage of increasing return.

Stage II: Total product continues to increase at a diminishing rate until it reaches its maximum point at the end of this stage. Both AP and MP diminish, but are positive. At the end of the second stage, MP becomes zero. MP is zero when the TP is at the maximum. AP shows a steady decline throughout this stage. As both AP and MP decline, this stage is known as stage of diminishing return.

Stage III: In this stage the TP declines. AP shows a steady decline, but never becomes zero. MP becomes negative. It goes below the X axis. Hence the 3rd stage is known as stage of negative return.

According to classical economists there were three laws of returns: (i) Law of increasing returns, (ii) Law of constant returns, and (iii) Law of diminishing returns. But the modern economists do not accept this. According to them there are not three laws of

125

production but there is only one law of production i.e. law of variable proportion. It has three stages.

It is necessary to understand the following terms:

Total Product or Total Physical Product (TPP): This is the quantity of output a firm obtains in total from a given quantity of input.

Average Product or Average Physical Product (APP): This is the total physical product (TPP) divided by the quantity of input.

Marginal Product or Marginal Physical Product (MPP): It is the increase in total output that results from a one unit increase in the input, keeping all other inputs constant.

Assumptions of the Law

The law of variable proportion is valid when the following conditions are fulfilled:

1.   The technology remains constant. If there is an improvement in the technology, due to inventions, the average and marginal product will increase instead of decreasing.

2.   Only one input factor is variable and other factor are kept constant.

3.   All the units of the variable factors are identical. They are of the same size and quality.

4.   A particular product can be produced under varying proportions of the input combinations.

5.   The law operates in the short run.

14.3 Why does the Law of Variable Proportions operate?

The law of variable proportion operates on account of the following reasons:

1.   **Imperfect substitutes:** There is a limit to the extent to which one factor can be substituted for another. In other words, two factors are not perfect substitutes. For example, in the construction of building, capital cannot substitute labour fully.

126

2.   **Scarcity of the factors of production:** Output can be increased only by increasing the variable factors. In the short run certain input factors like land and capital are scarce. This leads to diminishing marginal productivity of the variable factors.

3.   **Economies and diseconomies of scale:** The internal and external economies of large scale production are available as production is expanded. Therefore average cost goes on diminishing. But this continues only up to a certain stage. When the production is expanded beyond a level the diseconomies will start entering into production. Hence the output will come down (or cost will go up).

4.   **Specialisation :** The stage of diminishing returns comes into operation when the limit to maximum degree of specialisation reaches. This stage emerges when the fixed factor becomes more and more scarce in relation to the variable factor thereby giving less and less support to the latter. As a result of this, the efficiency and productivity of the variable factor diminish.

14.4 Importance of the Law of Variable Proportion

The law of variable proportion is one of the most fundamental laws of Economics. The law of variable proportion is applicable not only to agriculture but also to other constructive industries like mining, fishing etc. It is applied to secondary or tertiary sectors too. This law helps the management in the process of decision making.

The law is a law of life and can be applicable anywhere and everywhere. The applications of this law are as follows:

Basis of Malthusian theory of population: Malthus based his theory of population on the law of variable proportion.

1.   **Basis of the Ricardian theory of rent**: Ricardo's theory of rent is based on this law.

2.   **Basis of the marginal productivity theory of distribution:** The marginal productivity theory of distribution is also based on this law.

3.   **Optimum production**: This law can be used to estimate the optimum proportion of the factors for the producer.

127

4. **Price determination:** This law is also important in the price determination.

5. **Explanation of disguised unemployment**: Less developed countries like India have good deal of disguised unemployment. Many farm workers are in fact surplus. This is called disguised unemployment. The law helps us in explaining the presence of disguised unemployment.

In short, the law of variable proportion is a universal law.

14.5 LAWS OF RETURNS TO SCALE

The law of variable proportion analyses the behaviour of output when one input factor is variable and the other factors are held constant. Thus it is a short run analysis. But in the long run all factors are variable. When all factors are changed in same proportion, the behaviour of output is analysed with laws of returns to scale. Thus law of returns to scale is a long run analysis. In the long period, output can be increased by varying all the input Factors this law is concerned, not with the proportions between the factors of production, but with the scale of production. The scale of production of the firm is determined by those input factors which cannot be changed in the short period. The term return to scale means the changes in output as all factors change in the same proportion. The law of returns to scale seeks to analyse the effects of scale on the level of output. If the firm increases the units of both factors labour and capital, its scale of production increases.

The return to scale may be increasing, constant or diminishing. We shall now examine these three kinds of returns to scale.

Increasing Returns to Scale

When inputs are increased in a given proportion and output increases in a greater proportion, the returns to scale are said to be increasing. In other words, proportionate increase in all factors of production results in a more than proportionate increase in output It is a case of increasing returns to scale. For example, if the inputs are increased by 40% and output increased by 50%, return to scale are increasing (= >1). It is the first stage of production.

If the industry is enjoying increasing returns, then its marginal product increases. As the output expands, marginal costs come down. The price of the product also comes down.

Constant Return to Scale

128

When inputs are increased in a given proportion and output increases in the same proportion, constant return to scale is said to prevail. For example, if inputs are increased by 40% and output also increases by 40%, the return to scale are said to be constant (= 1). This may be called homogeneous production function of the first degree.

In case of constant returns to scale the average output remains constant. Constant returns to scale operate when the economies of the large scale production balance with the diseconomies.

Decreasing Returns to Sale

Decreasing returns to scale is otherwise known as the law of diminishing returns. This is an important law of production.

If the firm continues to expand beyond the stage of constant returns, the stage of diminishing returns to scale will start operate. A proportionate increase in all inputs results in less than proportionate increase in output, the returns to scale is said to be decreasing. For example, if inputs are increased by 40%, but output increases by only 30%, (= < 1), it is a case of decreasing return to scale. Decreasing return to scale implies increasing costs to scale.

14.6 Production Function with Two Variable Inputs

So far we have assumed that the firm is increasing output either by using more of one input (in laws of return) or more of all inputs (in laws of returns to scale). Let us now consider the case when the firm is expanding production by using more of two inputs (varying) that are substitutes for each other. A production function with two variable inputs can be represented by isoquants. Isoquant is a combination of two terms, namely, iso and quant. Iso means equal. Quant means quantity. Thus isoquant means equal quantity or equal product. Isoquants are the curves which represent the different combination of inputs producing a particular quantity of output. Any point on the isoquant represents or yields the same level of output. Thus isoquant shows all possible combinations of the two inputs (say labour and capital) capable of producing equal or a given level of output. Isoquants are also known as iso product curves or equal product curves or production indifferent curves.

An isoquant may be explained with the following example:

Equal Product Combinations

Table. 3

Combination	Units of labour	Units of Capital	Total Output
A	20	1	1000
B	15	2	1000
C	11	3	1000
D	8	4	1000
E	6	5	1000

In the above schedule, there are five possible combinations. All the five combinations yield the same level of output i.e. 1000 units. 20 units of labour and 1 unit of capital produce 1000 units. 15 units of labour and 2 units of capital also produce 1000 units and so on. All combination are equally likely because all of them produce the same level of output i.e. 1000 units. Now if plot these combination of labour and capital, we shall get a curve. This curve is known as an isoquant.

In the below diagram units of capital are measured on horizontal axis and units of labour on vertical axis. The five combinations are known as A, B, C, D and E. After joining these points, we get the iso product curve IQ. Here we assume that the level of technology remains constant. We also assume that the input can be substituted for each other. If quantity of labour is reduced, the quantity of capital must be increased to produce the same output. Thus an isoquant shows various combinations of the two inputs in the existing state of technology which produce the same level of output.
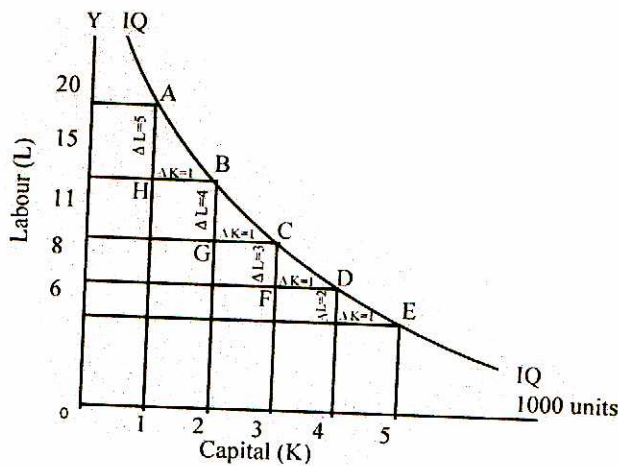
Fig. 6

Diminishing Marginal rate of Technical Substitution

As already stated, an important assumption in the isoquant diagram is that the inputs can be substituted for each other. If a unit of labour is reduced, the units of capital must be increased in order to produce the same output. Here we want to know the rate at which one factor is substituted for the other. The term marginal rate of technical substitution refers to the rate at which one factor of production is substituted in place of the other factor, the quantity of output remaining the same. It is the rate at which one input must be substituted for another, in order to keep the same level of output. Thus the marginal rate of technical substitution of capital for labour may be defined the units of labour which can be replaced by one unit of capital; keeping the same level of output. In other words, it is the ratio of small decrease in the amount of labour and a small increase in the amount of capital so as to keep the same level of output. The ratio of $\frac{\Delta L}{\Delta K}$ is called the marginal rate of technical substituttion of capital for labour. ΔL refers to changes in the units of labour and ΔK refers to change in the units of capital. In Fig.6 on the 1Q for 1000 units the MRTS$_{KL}$ over AB segment is $\frac{AH}{HB} = \frac{\Delta L}{\Delta K} = \frac{5}{1}$ Over the segment BC is $\frac{BG}{GC} = \frac{4}{1}$ and so on. In short, the marginal rate of technical substitution of $\frac{\Delta L}{\Delta K}$ measures the slope of the isoquant at a particular point. For example, the slope of the isoquant at point A is $\frac{\Delta L}{\Delta K} = \frac{5}{1}$ where as at B $\frac{\Delta L}{\Delta K} = \frac{4}{1}$ it is Thus the slope of an isoquant at a point represents marginal rate of technical substitution. It is also important to note that the marginal rate of technical substitution is the ratio of marginal productivity of labour to marginal productivity of capital.

As more and more units of capital are substituted to labour, each additional unit of capital contributes less and less output, while when labour is reduced each last unit of labour contributes more and more to output, because inefficient units of capital are coming to production while inefficient units of labour are going out of production. Marginal productivity of capital will decrease and marginal productivity of labour will

131

increase. Thus when we move from left to right on an isoquant (substituting more capital in place of labour) $\dfrac{MPK}{MPL}$ diminish.

As more capital is used, marginal productivity of capital will get diminished. At the same time as the unit of labour is reduced, the marginal productivity of labour will increase. Hence the marginal rate of technical substitute of capital for labour diminishes so as to maintain the same quantity. It is shown as follows:

$$\text{MRTS}_{KL} = \dfrac{\Delta L}{\Delta K} = \dfrac{MPK}{MPL}$$

Isoquant Map or Equal Product Map

An isoquant map consists of a number of isoquants. An isoquant map gives a set of equal product curves which show different production levels. Each isoquant in the map indicates different levels of output. A higher isoquant represents a higher level of output. The distance of an isoquant from the origin shows the relative levels of output. The farther the isoquant from the origin the greater will be the level of output along it. But it should be noted that the distance between two equal product curves does not measure the absolute difference in the volume of output. Isoquant map is shown in the following diagram.
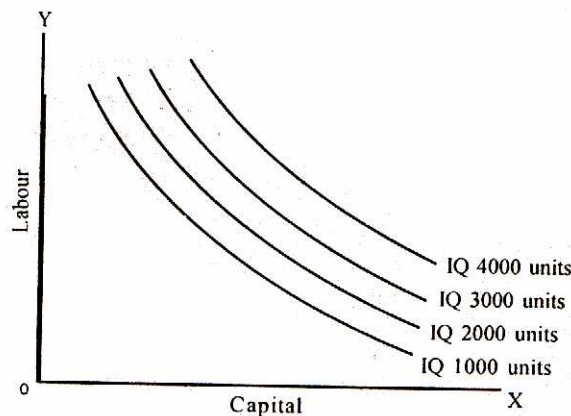
Fig. 7

Properties or Features of Isoquant

The following are the important properties of isoquants:

132

1. Isoquant is downward sloping to the right. This means that if more of one factor is used less of the other is needed for producing the same output.

2. A higher isoquant represents larger output.

3. No isoquants intersect or touch each other. If so it will mean that there will be a common point on the two curves. This further means that same amount of labour and capital can produce the two levels of output which is meaningless. The isoquant as shown in Fig.8 will never exist.
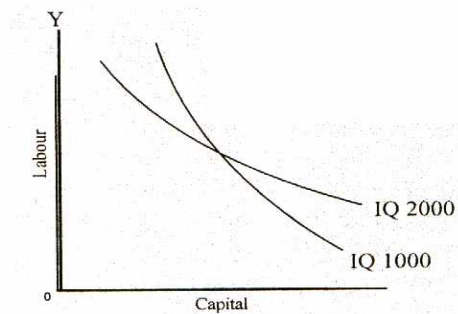
4. Isoquants need not be parallel to each other. It so happens because the rate of substitution in different isoquant schedules need not necessarily be equal. Usually they are found different and therefore, isoquants may not be parallel.
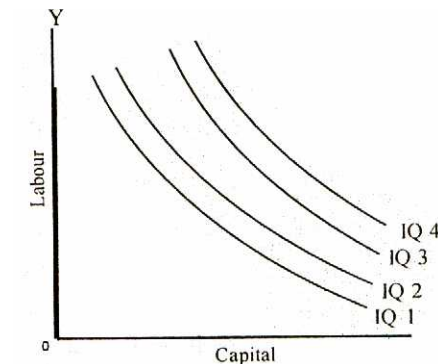
Fig. 9

5. Isoquant is convex to the origin. This implies that the slope of the isoquant diminishes from left to right along the curve. This is because of the operation of the principle of diminishing marginal rate of technical substitution.

133
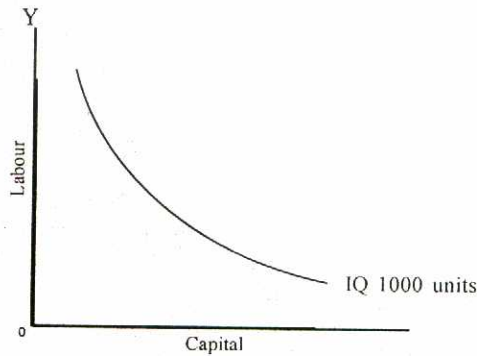
Fig.10

6. No isoquant can touch either axis. If an isoquant touches X axis then it would mean that without using any labour the firm can produce output with the help of capital alone. But this is wrong because the firm can produce nothing with OK units of capital alone. If an isoquant touches Y axis, it would mean that without using any capital the firm can produce output with the help of labour alone. This is impossible.

7. Isoquants have negative slope. This is so because when the quantity of one factor (labour) is increased the quantity of other factor (capital) must be reduced, so that total output remains the same. If the marginal productivity of the factor becomes zero the isoquant will bend back and it will have positive slope as shown below.
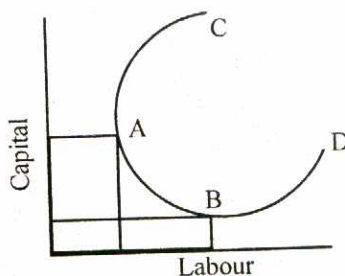
Fig.11

The portions AC and BD of the isoquant have positive slope.

134

If the inputs are perfect substitutes, each isoquant will be a straight line (case a). If the inputs cannot be substituted at all, the isoquants will be right angles (case b). Typical isoquants lie between the extreme cases of straight lines and right angles (case c). Along a curved isoquant, the ability to substitute one input for another varies.
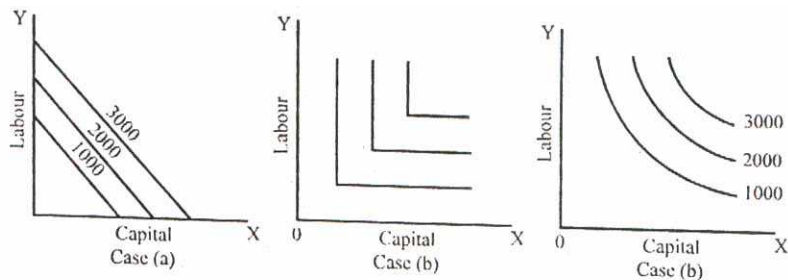
Optimum Input Combination (Least cost combination or Producer's Equilibrium)

The isoquant shows different combinations of two factors producing the same level of output. However, the producer will not accept all combinations. He wants to maximise his profit. It is possible only by maximising the output at minimum cost. Therefore, he will select the optimum input combination which involves the least cost. Optimum input combination or least cost combination is that combination which produces maximum output at the minimum cost. In other words, the optimum or least cost combination is that combination where the average cost of production is the minimum. This is the producer's equilibrium. This can be found out by combining the firm's production function and cost function. The production function is represented by isoquant and cost function is represented by iso-cost curve.

The principle of least cost combination is based on the following assumptions:

1.   Capital and labour are the two factors involved in production.
2.   All the units of both the factors are homogeneous.
3.   The prices of the input factors are given.
4.   The total money outlay is also given.
5.   There is perfect competition in the factor market.

135

In order to analyse producer's equilibrium the firm should combine its isoquant (already discussed) and iso-cost line.

Iso-cost Curve

In order to select the optimum quantity of two inputs, the firm has to consider their quantities and their prices. Factors of production are available at a price. Therefore their prices and amount of money which the firm wants to spend has to be taken into consideration. Isocost line represents these two things.

An isocost line indicates the different combination of the two factors which the firm can buy at given prices with a given amount of money. It shows all the combinations of labour and capital that the firm can purchase with a given outlay and at given prices. Thus isocost shows the prices of the two factors and the total amount of money to spend. To make it more clear, let us take an example. Suppose a firm deci to spend Rs.5000 on 2 factors - capital and labour. If the weekly wage of a worker is Rs.50, the firm can employ 100 workers. Similarly if one unit of capital costs Rs.20, the firm buy 250 units of capital. Thus the firm can spend the whole amount of Rs.5000 either on labour (100 workers) or on capital (250 units) or partly on labour and partly on capital. The isocost line is shown in the Fig. 12
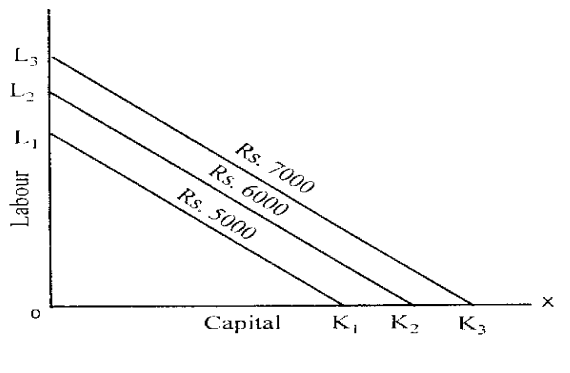
Fig. 12

The isocost line L, K, indicates on outlay of Rs.5000. With Rs.5000 the firm can buy either OL, units of labour or OK., units of capital or any combination of labour and capital between the extremes L(K.,. Similarly the isocost line L2 K... shows an outlay of Rs.6000 which means that either 120 workers may be employed or 300 units of capital may be bought or some units of both capital and labour. Thus isocost line shows all those

136

combinations of capital and labour which the firm can use with the given amount of money. An isocost curve represents the same cost for all the different combination of input. Isocost line is always a straight line (because the firm has no control over market prices of factors).

The slope of the isocost line is determined by the firm's outlay and the price of two factors. It represents the ratio of the price of capital to the price of labour $= \frac{\text{Pr } ice \ of \ capital}{\text{Pr } ice \ of \ labour}$. If the price of any one of the factors changes, there would be a corresponding change in the slope of the isocost line. If the firm wants to spend more amounts there will be a parallel upward shift in the isocost line. If it wants to spend less, there will be a parallel downward shift in the isocost line.

Selection of the Optimum or Least Cost Combination

The optimum or least cost combination (producer's equilibrium) can be found out with the help of isoquants and isocost lines. A firm's equilibrium will be attained at a point where the isoquant touches the isocost line. This may be explained with the help of the following diagram.
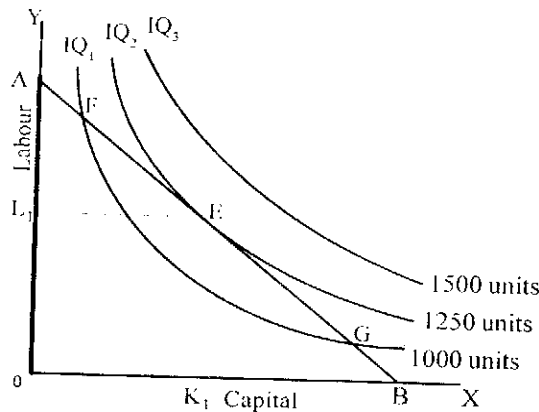
Fig. 13

Equal product curves (IQ_1, IQ_2, and IQ_3), represent output of 1000 units, 1250 units and 1500 units respectively. AB is the isocost line representing the outlay of Rs. 5000. At point E the isocost line AB is tangent to isoquant IQ_2, representing 1250 units. The Isocost curve and Isoquant curve are equal at this point. Therefore combination of L_1,

137

labour K_1, capital is the least cost combination to produce the output of 1250 units. F and G are not least cost combination because they lie on the lower isoquant curve indicating lesser output of 1000 units. Cost will be minimum at point E because it is at this point the Isocost line AB is tangent to Isoquant IQ_2. The firm is in equilibrium at point E. At E the average cost is Rs. 4 (5000/1250). At an output of 1000 units the average cost would be Rs. 5 (5000/1000). He cannot produce an output of 1500 units because he has only Rs. 5000 with him to spend. The combination at point E is thus the least cost combination. This combination will give maximum output at minimum cost.

At the point E the slope of isoquant is equal to the slope of isocost line. The ratio between the prices of capital and labour and the MRTS are equal.

$$MRTS_{KL} = \frac{\Pr ice\ of\ capital}{\Pr ice\ of\ labour}$$

Capital is substituted for labour.

Slope of isocost line $= \dfrac{\Pr ice\ of\ capital}{\Pr ice\ of\ labour}$

This is the point of optimum input combination

$MRTS_{KL} =$ Slope of the isocost line $= \dfrac{\Pr ice\ of\ capital}{\Pr ice\ of\ labour}$

The equality between the MRTS between price of capital and labour to the price ratio gives maximum output at minimum cost.

14.7 LET US SUM UP

In this lesson we studied the concept o laws of production. We identified the constituents of laws of production. We studied in detail the law of diminishing returns or otherwise called as law of variable proportion. We also discussed in detail the law of returns to scale.

14.8 LESSON - END ACTIVITIES

1. Prove the operation of law of variable proportion

2. Why does law of variable proportion operate?

3. Explain law of returns to scale.

14.9 REFERENCES

1. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics".

2. Su8ndharam, K.P.M. "Business Economics.

Lesson: 15 -ECONOMIES OF SCALE

CONTENTS

15.0 Aims and Objectives

15.1 Introduction

15.2 Internal Economies and Diseconomies

15.3 External Economies and Diseconomies

15.4 Let us Sum up

15.5 Lesson – end activities

15.6 References

15.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To understand the concept of economies of scale

- To know about Internal Economies, External Economies and Diseconomies.

15.1 INTRODUCTION

In the long run when scale of production is increased firm gets economies of scale up to a point. The term "economies" refers to cost advantage. Economies of scale refer to advantages of large scale production. Marshall has classified economies of scale into two-internal economies and external economies.

Diseconomies are the disadvantages which a faces when the scale of production is expanded beyond a certain level diseconomies may be of two types- internal and external diseconomies.

15.2 Internal Economies and Diseconomies: We saw that returns to scale increase in the initial stages and after remaining constant for a while, they decrease. The question arises as to why we get increasing returns to scale due to which cost falls and why after a certain point we get decreasing returns to scale due to which cost rises. The answer is that initially a firm enjoys internal economies of scale and beyond a certain limit it suffers from internal diseconomies of scale. Internal economies and diseconomies are of following main kinds:

(i) Technical economies and diseconomies: Large-scale production is associated with technical economies. As the firm increases its scale of operations, it becomes possible to use more specialised and efficient form of all factors, specially capital equipment and machinery. For producing higher levels of output, there is generally available a more efficient machinery which when employed to produce a large output yields a lower cost per unit of output. Secondly, when the scale of production is increased and the amount of labour and other factors become larger, introduction of a greater degree of division of labour or specialisation becomes possible and as a result cost per unit declines.

However, beyond a certain point a firm experiences net diseconomies of scale. This happens because when the firm has reached a size large enough to allow utilisation of almost all the possibilities of division of labour and the employment of more efficient machinery, further increase in the size of the plant will bring high long-run cost because of difficulties of management. When the scale of operations becomes too large, it becomes difficult for the management to exercise control and to bring about proper coordination.

(ii) Managerial economies and diseconomies: Managerial economies refer to reduction in managerial cost. When output increases, division of labour can be applied to management. The production manager can look after production, sales manager can look after sales, finance manager can look after finance department. If scale of production

140

increases further, each department can be further sub-divided for e.g. sales can be split into sections for advertising exports and customer service.

Since individual activities come under the supervision of specialists, management's efficiency and productivity greatly improve. Decentralisation of decision making authority also becomes possible in such a firm which enhances further the efficiency and productivity of managers. Thus specialisation of management enables large firms to achieve reduction in managerial costs.

However, as scale of production increases beyond a certain limit, managerial diseconomies set in. Management finds it difficult to exercise control and bring coordination among various departments. The managerial structure becomes more complex and is affected by more bureaucracy, more red tape, lengthening of communication lines and so on. All these affect the efficiency and productivity of management and the firm itself.

(iii) Commercial economies and diseconomies: Production of big volumes of goods requires large amount of material and components. This enables the firm to place a bulk order for materials and components and enjoy lower prices for them. Economies can also be achieved in selling the product. If the sales staff is not being worked to capacity, additional output can be sold at little extra cost. Moreover, large firms can benefit from economies of advertising. As scale of production increases, advertising costs per unit of output fall. In addition, a large firm may also be able to sell its by-products-something which might be unprofitable for a small firm.

These economies become diseconomies after an optimum scale. For example, advertisement expenditure and other marketing overheads will increase more than proportionately after the optimum scale.

(iv) Financial economies and diseconomies: In raising finance for expansion large firm is in favorable position. It can, for instance, offer better security to bankers and, because it is well-known, raise money at lower cost, since investors have confidence in it and prefer shares which can be readily sold on the stock exchange.

However, these financial costs will rise more proportionately after the optimum scale of production. This may happen because of relatively more dependence on external finances.

141

(v) Risk bearing economies and diseconomies: It is said that a large business with diverse and multi-production capability is in a better position to withstand economic ups and downs, and therefore, enjoys economies of risk bearing.

However, risk may increase if diversification instead of giving a cover to economic disturbances increases these.

15.3 External Economies and Diseconomies: The use of greater degree of division of labour and specialised machinery at higher levels of output are termed as internal economies. They are internal in the sense that they accrue to the firm due to its own efforts. Besides internal economies, there are external economies which are very important for a firm. External economies and diseconomies are those economies and diseconomies which accrue to firms as a result of expansion in the output of whole industry and they are not dependent on the output level of individual firms. They are external in the sense they accrue to firms not out of their internal situation but from outside i.e. expansion of the industry. These are available to one or more of the firms in the form of :

1. Cheaper raw materials and capital equipment: The expansion of an industry may result in exploration of new and cheaper sources of raw material, machinery and other types of capital equipment. Expansion of an industry results in greater demand for the various kinds of materials and capital equipment required by it. This makes it possible to purchase on a large scale from other industries. This reduces their cost of production and hence their prices. Thus, firms using these materials and capital equipment will be able to get them at a lower price.

2.Technological external economies : When the whole industry expands, it may result in the discovery of new technical knowledge and in accordance with that the use of improved and better machinery than before. This will change the technical co-efficient of production and will enhance productivity of firms in the industry and reduce their cost of production.

3.Development of skilled labour : When an industry expands in an area the labour in that area is well accustomed to do the various productive processes and learns a good deal from the experience. As a result, with the growth of an industry in an area a pool of

142

trained labour is developed which has a favorable effect on the level of productivity and cost of the firms in that industry.

4. Growth of ancillary industries: With the growth of an industry, a number of ancillary industries may specialise in production of raw materials, tools and machinery etc. They can provide them at a lower price to the main industry. Likewise, some firms may get developed processing the waste products of the industry and making out some useful product out of it. This will tend to reduce the cost of production in general.

5. Better transportation and marketing facilities: The expansion of an industry resulting from entry of new firms may make possible the development of transportation and marketing network to a great extent which will greatly reduce cost of production of the firms. Similarly, communication system may get modernised resulting in better and speedy information.

However, external economies may also cease if there are certain disadvantages which may neutralise the advantages of the expansion of an industry. We call them external diseconomies. An example of external diseconomies is the rise in some factor prices. When an industry expands, the requirement of the various factors of production increases; for example, that of all raw materials, capital goods, skilled labour and so on. This may result in pushing up the prices of such factors of production specially when they are short in supply. Moreover, too many firms in an industry at one place may also result in higher transportation cost, marketing cost and high pollution control cost. The government may also through its locational policy prohibit or restrict expansion of an industry   at   a   particular   place.

15.4 LET US SUM UP

In this lesson we came to understand that the term 'Economies' refers to cost advantage. Economies of scale refer to advantages of large scale production. We have also studied about internal, external and diseconomies.

15.5 LESSON – END ACTIVITIES

1. Discuss about the kinds of internal economies and diseconomies
2. Discuss the external reasons by which the companies attain economies of scale.

15.6 REFERENCES

1. Maddala, G.S. and Ellenmiller, Micro Economics.
2. Mote V.L. Samuel Paul and G.S. Gupta, "Managerial Economics".

UNIT IV

MARKET ANALYSIS

Lesson: 16 -BASICS OF MARKET STRUCTURE

CONTENTS

16.0 Aims and Objectives

16.1 Introduction

16.2 Classification of Market

16.3 Let us sum up

16.4 Lesson end activities

16.5 Referneces

16.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To define the term Market

- To identify the basic components of a market

- To classify the different types of market

16.1 Introduction

In ordinary language, the term market refers to a public place in which goods and services are bought and sold. In economics, it has a different meaning. Different economists have tried to define market in different ways. Cournot defines market as, "not any particular market place in which things are bought and sold, but the whole of any region in which buyers and sellers are in such free intercourse with each other that the prices of the same goods tend to equality easily and quickly". To Ely, "Market means the general field within which the force determining the price of particular product operate". According to Benham," Market is any area over which buyers and sellers are in close touch with one another, either directly or through dealers, that the price obtainable in one

part of the market affects the prices paid in other parts". Stonier and Hague explain the term market as "any organisation whereby buyers and sellers of a good are kept in close touch with each other". There is no need for a market to be in a single building.

The only essential for a market is that all buyers and sellers should be in constant touch with each other, either because they are in the same building or because they are able to talk to each other by telephone at a moment's notice.

Thus a market has the following basic components.

1. There should be buyers of the product. If a country consists of people who are very poor, there can hardly be market for luxuries like cars, VCR etc.

2. A commodity should be offered for sale in the market. Otherwise there is no question of buying the commodity. Therefore, existence of sellers is a necessity for any market.

3. Buyers and sellers should have close contact with each other.

4. There should be a price for the commodity. The exchange of commodities between buyers and sellers occurs at a particular price which is mutually agreeable to both the buyers and sellers.

16.2 CLASSIFICATION OF MARKET

Market may be classified into different types:

On the basis of area

Markets may be classified on the basis of area into local, national and international markets. If the buyers and sellers are located in a particular locality, it is called as a local market, e.g. fruits, vegetables etc. These goods are perishable; they cannot be stored for a long time; they cannot be taken to distant places. When a commodity is demanded and supplied all over the country, national market is said to exist. When a commodity commands international market or buyers and sellers all over the world, it is called international market.

Whether a market will be local, national or international in character will depend upon the following factors: (a) nature of commodity; (b) taste and preference of the people; (c) availability of storage; (d) method of business; (e) political stability at home and abroad; if) portability of the commodity.

146

On the basis of time

Time element has been used by Marshall for classifying the market. On the basis of time, market has been classified into very short period, short period, long period and very long period. Very short period market refers to the market in which commodities that are fixed in supply or are perishable are transacted. Since supply is fixed, only the changes in demand influence the price. The short period markets are those where supply can be increased but only to a limited extent. Long period market refers to a market where adequate time is available for changing the supply by changing the fixed factors of production. The supply of commodities may be increased by installing a new plant or machinery and the output can be changed accordingly. Very long period or secular period is one in which changes take place in factors like population, supply of capital and raw material etc.

On the basis of nature of transactions

Markets are classified on the basis of nature of transactions into two broad categories viz., Spot market and future market. When goods are physically transacted on the spot, the market is called as spot market. In case the transactions involve the agreements of future exchange of goods, such markets are known as future markets.

On the basis of volume of business

Based on the volume of business, markets are broadly classified into wholesale and retail markets. In the wholesale markets, goods are transacted in large quantities. Wholesale markets are in fact, a link between the producer and the retailer while the retailer is a link between the wholesaler and the consumer.

On the basis of status of sellers

During the process of marketing, a commodity passes through a chain of sellers and middlemen. Markets can be classified into primary, secondary and terminal markets.

The primary market consists of manufacturers who produce and sell the product to the wholesalers. The wholesalers who are an international link between the manufacturers and retailers constitute secondary markets while the retailers who sell it to the ultimate consumer constitute the terminal market.

On the basis of regulation

On this basis, market is classified into regulated and unregulated markets. For some goods and services, the government stipulates certain conditions and regulations for their transactions. Market of goods and services is called regulated market. On the other hand, goods and services whose transactions are left to the market forces belong to unregulated market. Regulations of market by the government become essential for those goods whose supply or price can be manipulated against the interests of the general public.

On the basis of competition

Markets are classified on the basis of nature of competition into perfect competition and imperfect competition.

16.3 LET US SUM UP

In this lesson we have learned various definitions of the term market. We also listed the basic components of the market and we classified different types of market.

16.4 LESSON - END ACTIVITIES

1. Define the term market

2. List the components of a market

3. Classify the different types of market.

16.5 REFERENCES

1. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics.

2. McGuigan, Moyer and Harris: Managerial Economics, West Publishing Company

Lesson: 17 -PERFECT COMPETITION

CONTENTS

17.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To understand the Perfect Competition market structure
- To analyze the Price and Output decision under perfect competition

17.1 INTRODUCTION

The term market structure refers to the degree of competition prevailing in that particular market. For price analysis it is vital for business management to gain knowledge of the nature and process of competition in the prevailing business society.

Hence a thorough study on the different types of market structure is essential for the determination of price. In this lesson we will confine our discussion to perfect competition.

17.2 PERFECT COMPETITION

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

FEATURES

1.   Large number of buyers and sellers

There must be a large number of firms in the industry. Each individual firm supplies only a small part of the total quantity offered in the market. As a result, no individual firm can influence the price. Similarly, the buyers are also numerous. Hence, no individual buyer has any influence on the market price. The price of the product is determined by the collective forces of industry demand and industry supply. The firm is only a 'price taker'. Each firm has to adjust its output or sale according to the prevailing market price.

2.   Homogeneity of products

In a perfectly competitive industry, the product of any one firm is identical to the products of all other firms. The technical characteristics of the product as well as the services associated with its sale and delivery are identical.

Fig. 1.

150
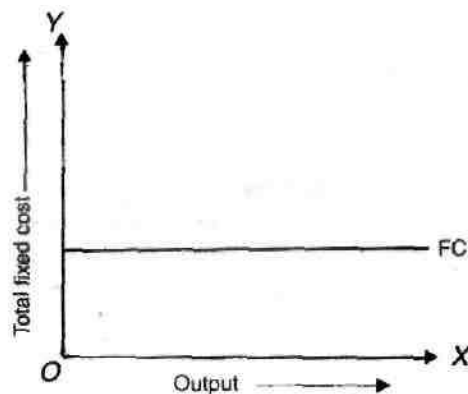
The demand curve of the individual firm is also its average revenue and its marginal revenue curve.

The assumptions of large numbers of sellers and product homogeneity imply that the individual firm in pure competition is a price taker. Its demand curve is infinitely elastic indicating that the firm can sell any amount of output at the prevailing market price.

3. Free entry exit

There is no barrier to entry or exit from the industry. Entry or exit may take time but firms have freedom of movement in and out of the industry. If the industry earns abnormal profits, new firms will enter the industry and compete away the excess profits. Similarly, if the firms in the industry are incurring losses some of them will leave the industry which will reduce the supply of the industry and will thus raise the price and wipe away the losses.

4. Absence of government regulation

There is no government intervention in the form of tariffs, subsidies, relationship of production or demand.

If these assumptions are fulfilled, it is called pure competition which requires the fulfillment of some more condition.

5. Perfect mobility of factors of production

The factors of production are free to move from one firm to another throughout the economy. It is also assumed that workers can move between different jobs. Raw materials and other factors are not monopolised and labour is not unionised. In short, there is perfect competition in the factor market.

6. Perfect knowledge

It is assumed that all sellers and buyers have complete knowledge of the conditions of the market. This knowledge refers not only to the prevailing conditions in the current period but in all future periods as well.

Information is free and costless. Under these conditions uncertainty about future developments in the market is ruled out.

7. Absence of transport costs

In a perfectly competitive market, it is assumed that there are no transport costs.

17.3 SHORT RUN EQUILIBRIUM OF THE FIRM

The firm is in equilibrium at the point of intersection of the marginal cost and marginal revenue curves. The first condition for the equilibrium of the firm is that marginal cost should be equal to marginal revenue. The second condition for equilibrium requires that marginal cost curve should cut the marginal revenue curve from below.

Fig. 2
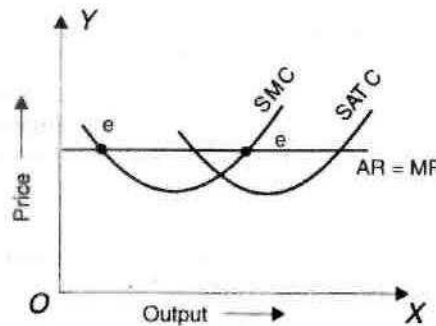
The firm is in equilibrium only at 'e' because only at 'e' both the conditions are satisfied. At 'e ' the firm is not in equilibrium as the second condition is not fulfilled.

The fact that the firm is in equilibrium in the short run does not mean that it makes excess profits. Whether the firm makes excess profits or losses depends on the level of average total cost at the short run equilibrium.

In figure 3. (A), the SATC is below the price at equilibrium; the firm earns excess profits. In figure 3. (B), the SATC is above the price; the firm makes a loss.

In the short run a firm generally keeps on producing even when it is incurring losses. This is so because by producing and earning some revenue, the firm is able to

152

cover a part of its fixed costs. So long as the firm covers up its variable cost plus at least a part of annual fixed cost, it is advisable for the firm to continue production. It is only when it is unable to cover any portion of its fixed cost, it should stop producing. Such a situation is known as shut down point. The shut down point of the firm is denoted by W. If price falls below P the firm does not cover its variable costs and is better off if it closes down.
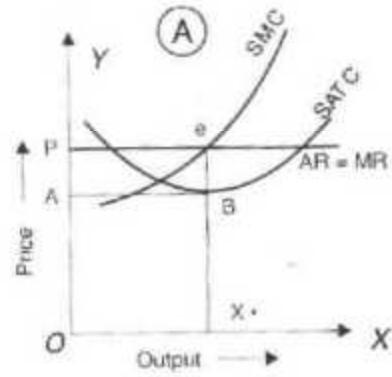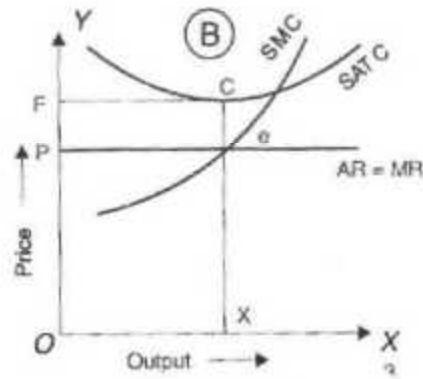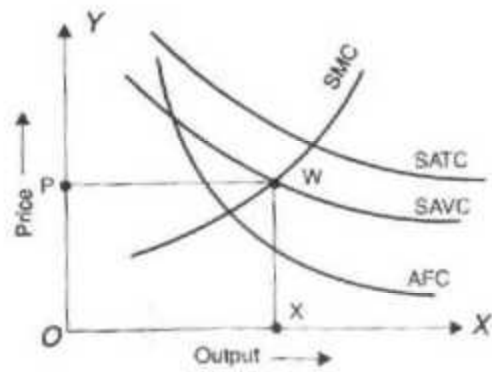
Fig. 3. (A)

Fig. 3. (B)

Fig. 4.

154

17.4 Short- runs Equilibrium of the industry.

Given the market demand and market supply, the industry is in equilibrium at the price at which the quantity demanded is equal to the quantity supplied.
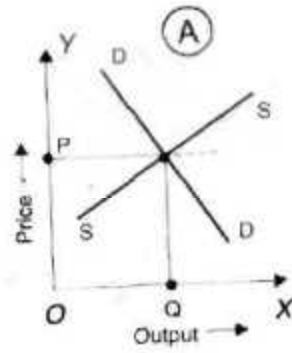
Fig. 5. (A) Short–run Industry Equilibrium
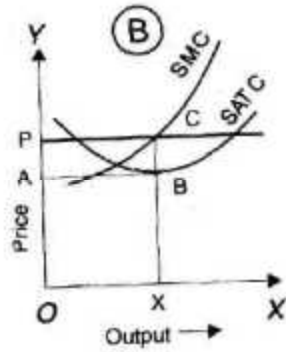
Fig.5. (B) Short–run Equilibrium (profits)
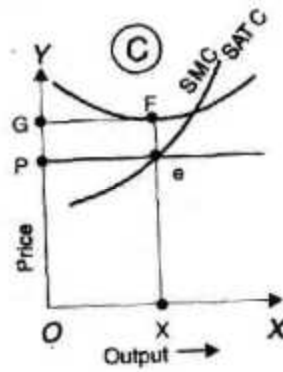
The industry is in equilibrium at price P at which the quantity demanded and supplied is OQ. However this will be a short-run equilibrium as some firms are earning abnormal profits and some incur losses as shown in figures 5. (B) and 5. (C) respectively. In the long run, firms that make losses will close down. Those firms which make excess profits will expand and also attract new firms into the industry. Entry, exit and readjustment will lead to long run equilibrium in which firms will be earning normal profits and there will be no entry or exit from the industry.

17.5 Long-run equilibrium of the firm

In the long run firms are in equilibrium when they have adjusted their plant so as to produce at the minimum point of their long run AC curve, which is tangent to the demand curve. In the long run the firms will be earning just normal profits, which are included in the LAC. The long run equilibrium position of the firm is shown in figure 6.
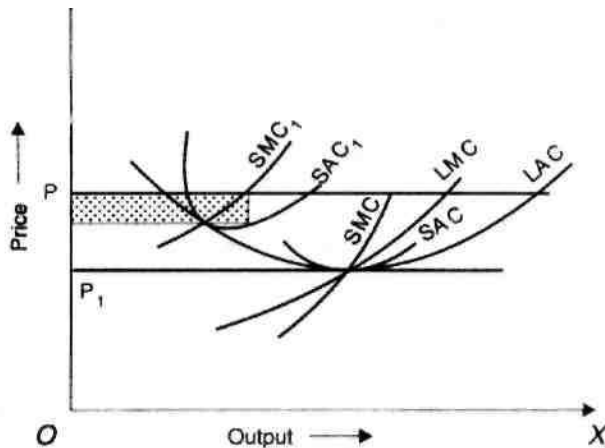

Fig. 6

At the price of OP, the firm is making excess profits. Therefore, it will have an incentive to build new capacity and hence it will move along its LAC. At the same time, attracted by excess profits new firms will be entering the industry. As the quantity supplied increases, the price will fall to P_i at which the firm and the industry are in long-run equilibrium. The condition for the long-run equilibrium of the firm is that the marginal cost tie equal to the price and to the long run-average cost.

$$LMC = LAC = P$$

156

The firm adjusts its plant size so as to produce that level of output I which the LAC is the minimum. At equilibrium the short run marginal is equal to the long run marginal cost and the short run average cost is equal to the long run average cost. Thus, in equilibrium in the long

$$SMC = LMC = LAC = SAC = P = MR$$

This implies that at the minimum point of the LAC the plant worked at its optimal capacity, so that the minimal of the LAC and SAC coincide.

17.6 Long-run Equilibrium of the Industry

The industry is in long run equilibrium when price is reach which all firms are in equilibrium producing at the minimum point oft LAC curve and making just normal profits. Under these conditions there is no further entry or exit of firms in the industry. The long run equilibrium is shown in the figure. 7.
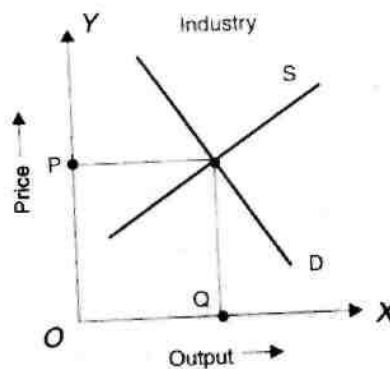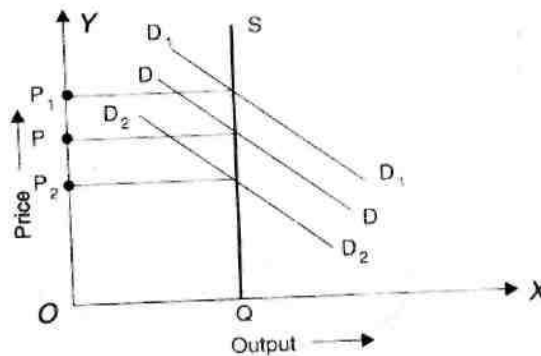

Fig. 7. Industry

157

At the market price P the firms produce at their minimum cost, earning just normal profits. The firm is in equilibrium because at the level of output x

LMC = SMC = P = MR

This equality ensures that the firm maximises its profit. At the price P the industry is in equilibrium because profits are normal and all costs are covered so that there is no incentive for entry or exit.

17.7 Price determination under perfect competition-Role of time

Price of a commodity in an industry is determined at that point where industry demand is equal to industry supply. Marshall laid emphasis on the role of time element in the determination of price. He distinguished three periods in which equilibrium between demand and supply was brought about viz., very short period or market period; short run equilibrium and long run equilibrium.

Market period

Price is determined by the equilibrium between demand and supply in market period. In the market period, the supply of commodity is fixed. The firms can sell only what they have already produced. This market period may be an hour, a day or few days or even few weeks depending upon the nature of the product. So far as the supply curve in a market period is concerned, two cases are prominent-one is that of perishable goods and the other is that of non perishable durable goods.

For perishable goods like fish, vegetables etc. the supply is given and cannot be kept for the next period; therefore, the whole of it must be sold away on the same day whatever be the price. The supply curve will be a vertical straight line.
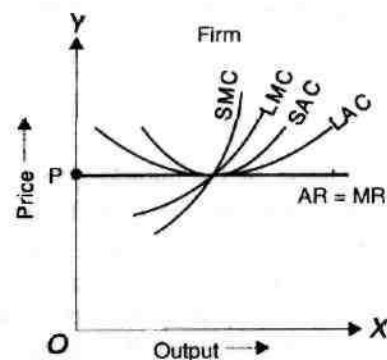

158

Fig. 8

QS is the supply curve. OQ is the quantity of fish available. DD is the market demand curve. The equilibrium price OP is determined at which quantity demanded is equal to the available supply i.e. at the point where DD intersects the vertical supply curve QS. If demand increases from DD to D_1D_1 supply remaining the same price will increase from OP to OP_1. On the contrary, if there is a decrease in demand from DD to D2D2 the price will fall and the quantity sold will remain the same.

If the commodity is a durable good, its supply can be adjusted to demand. If the demand for commodity declines the firms will start building inventories, while on the other hand, if demand goes up the firms will increase their supplies out of the existing stocks. The firm can keep on supplying out of its existing stocks only upto the availability of stocks. If demand increases beyond that level, the firm cannot supply any additional quantity of the good. Thus the supply curve for the durable goods is upward sloping upto a distance and then becomes vertical. A firm selling a durable good has a reserve price below which it will not like to sell. The reserve price, is influenced by the cost of production.
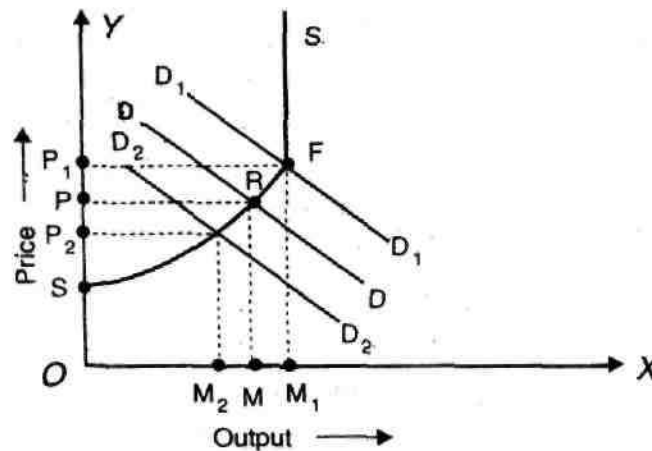

Fig. 9.

SRFS is the supply curve of the durable goods. OM_1 is the total amount of stock available. Upto OP_1 the quantity supplied varies will I price. At OS price, nothing is sold. It is the reserve price. At OP_1 price, the whole stock is offered for sale. DD is the demand

159

curve. Price ul determined at OP at which quantity demanded is equal to the quantity supplied. At this price OM quantity is sold. If demand increases form DD to $D_1 D_1$ the price will increase to OP_1 and the whole stock will be sold. If the demand decreases from DD to D2D2 the price will fall to OP2 and the amount sold will fall to OM2.

Short run equilibrium

In the short period the firm can vary its supply by changing the variable factors. Moreover, the number of firms in the industry cannot increase or decrease in the short run. Thus the supply of the industry can be changed only within the limits set by the plant capacity of the existing firms. The short period price is determined by the interaction of short period supply and demand curves. The determination of the short run price is shown in figure 10.
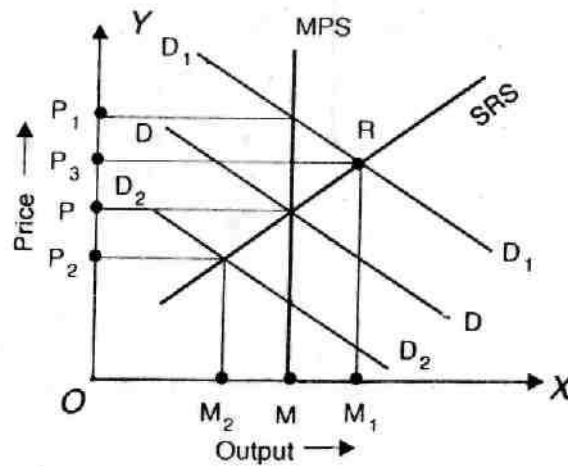

Fig. 10.

DD is the demand curve facing the industry. MPS is the market period supply, curve and SRS is the short run supply curve of the industry. If there is an increase in demand form DD to D1D1 the market price will increase from OP to OP1. The supply of the commodity will be increased by intensive utilisation of fixed factors and increasing the amount of variable factors. So in the short run price will fall to OP3 at which new demand curve D1D1 intersects the short run supply curve SRS. Thus OP3 is the short run price and quantity supplied has increased from OM to OM1.

160

Long-run equilibrium

In the long run, supply is adjusted to meet the new demand conditions. If there is an increase in demand, the firms in the long run will expand output by increasing the fixed factors of production. They may enlarge their old plants or build new plants. Moreover, in the long run new firms can also enter the industry and thus add to the supplies of the product. The determination of price in the long run is shown in figure 11.
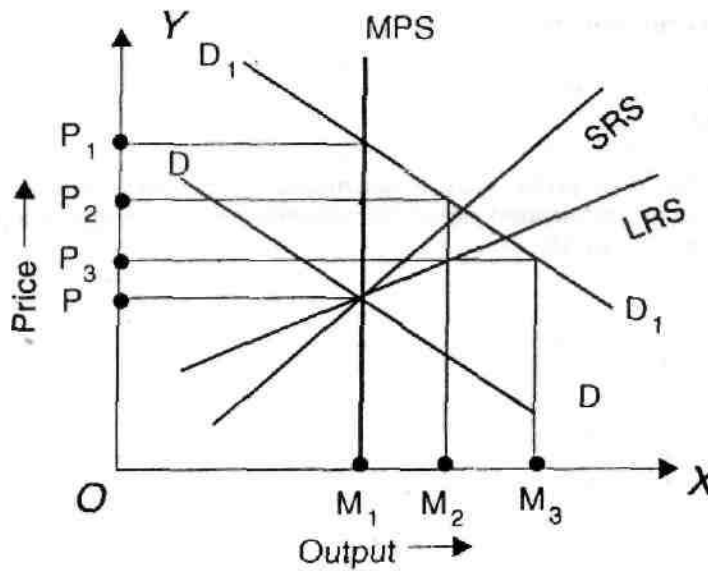

Fig. 11

LRS is the long run supply curve; MPS is the market period supply curve and SRS is the short run supply curve. DD is the market demand curve and OP is the market price. If there is an increase in demand from DD to D1D1 the market price will increase from OP to OP1. In the short run, however, the firms will increase output. Price in the short run will fall to OP2 at which D1D1 intersects the short run supply curve SRS. In the long run new firms will enter the industry. As a result output will increase and price will fall to OP3. Thus OP3 is the long run price.

17.8 LET US SUM UP

In this lesson we discussed the features of perfect competition. An extensive study is made on the price determination during short-run and long-run of the firm and industry in the perfect competition scenario.

161

17.9 LESSON-END ACTIVITIES

1. List the features of perfect competition

2. Illustrate the conditions for the establishment of firms equilibrium under perfect competition.

3. The concept of equilibrium is a vital tool in modern economic analysis –Discuss.

17.9 REFERENCES

1. Peterson, Craig, H. and Lewis Cris, W. "Mangaerial Economic, Pearson, Education Asia.

2. Mehta, P.L., "Managerial Economics, Sultan Chand & Sons.

3. Maurise, Charles, S. Thomas and Others "Mangerial Economics applied Micro Economics for Decision Making, Irwin.

4. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics.

5. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

6. Sankaran, "Buseinss Economics.

7. McGuigan, Moyer and Harris: Managerial Economics, West Publishing Company

Lesson: 18 – MONOPOLY AND MONOPOLISTIC COMPETITION

CONTENTS

18.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To understand the features of Monopoly and Monopolistic competition

- To analyse the price-output determination under Monopoly and Monopolistic competition

- To know about Concentration of Economic Power

- To explain the concept of Product differentiation

18.1 INTRODUCTION

The behaviour of a firm under two different market structures, namely monopoly and monopolistic competition is analysed in detail. While analysing the market structure it is essential to assume that the firms are guided by profit maximization.

18.2 MONOPOLY COMPETITION

Monopoly is that market form in which a single producer controls the entire supply of a single commodity which has no close substitutes. There must be only one seller or producer. The commodity produced by the producer must have no close substitutes. Monopoly can exist only when there are strong barriers to entry. The barriers which prevent the entry may be economic, institutional or artificial in nature.

Features

1.   There is a single producer or seller of the product.
2.   There are no close substitutes for the product. If there is a substitute, then the monopoly power is lost.
3.   No freedom to enter as there exists strong barriers to entry.
4.   The monopolist may use his monopolistic power in any manner to get maximum revenue. He may also adopt price discrimination.

18.3 PRICE-OUTPUT DETERMINATION UNDER MONOPOLY

The aim of the monopolist is to maximise profits. Therefore, he will produce that level of output and charge a price which gives him the maximum profits. He will be in equilibrium at that price and output at which his profits are maximum. In order words, he will be in equilibrium position at that level of output at which marginal revenue equals marginal cost. The monopolist, to be in equilibrium should satisfy two conditions :

1.   Marginal cost should be equal to marginal revenue and

2.   The marginal cost curve should cut marginal revenue curve from below.

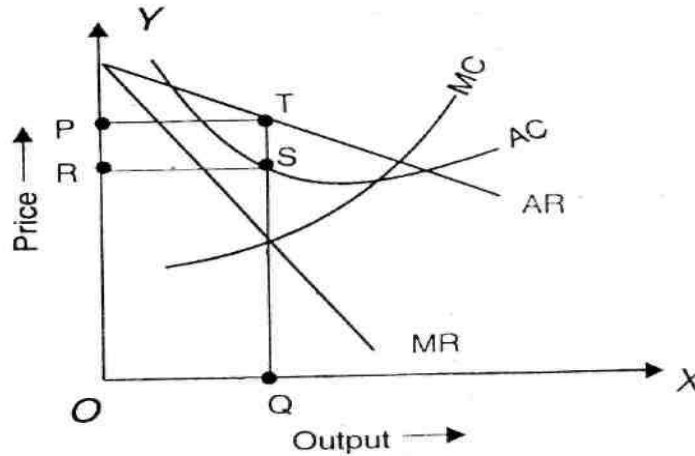The short run equilibrium of the monopolist is shown in figure 12.

Fig. 12

AR is the average revenue curve, MR is the marginal revenue curve, AC is the average cost curve and MC is the marginal cost curve. Upto OQ level of output marginal revenue is greater than marginal cost but beyond OQ the marginal revenue is less than marginal cost. Therefore, the monopolist will be in equilibrium where MC = MR. Thus a monopolist is in equilibrium at OQ level of output and at OP price. He earns abnormal profit equal to PRST.

But it is not always possible for a monopolist to earn super- normal profits. If the demand and cost situations are not favourable, the monopolist may realise short run losses.
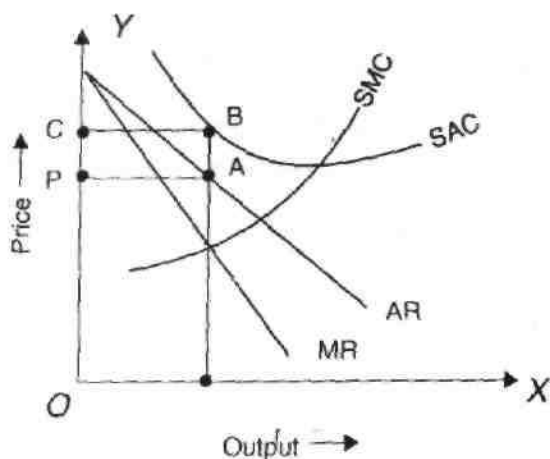
Fig. 13

Though the monopolist is a price maker, due to weak demand and high costs, he suffers a loss equal to PABC.

Long run equilibrium

In the long run the firm has the time to adjust his plant size or to use the existing plant so as to maximise profits. The long run equilibrium of the monopolist is shown in figure 14.

Fig. 14

The monopolist is in equilibrium at OL output where LMC cuts MR curve. He will charge OP price and earn an abnormal profit equal to TPQH.

166

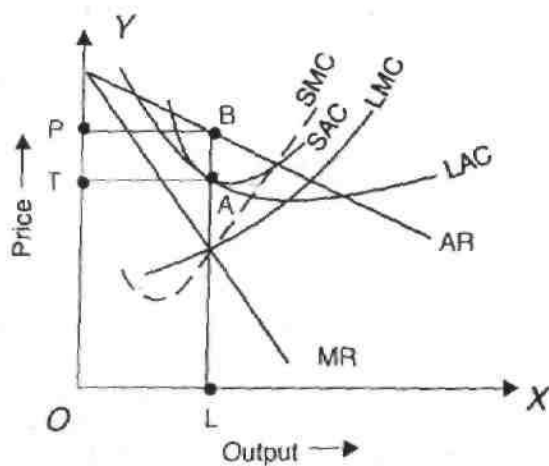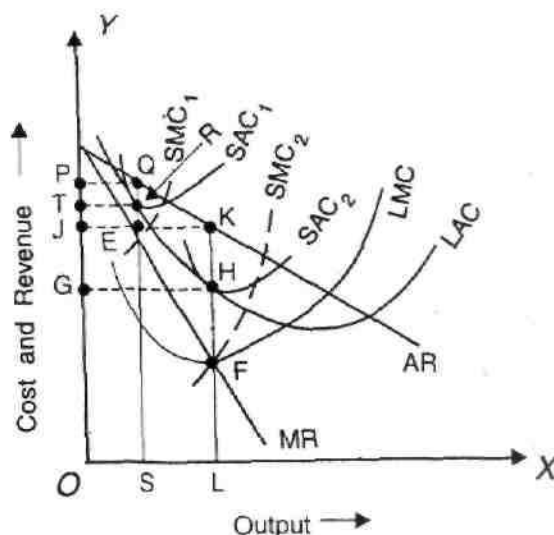In order to show the difference between the short run equilibrium and long run equilibrium under monopoly, both can be shown in a single figure.

The monopolist is in the short run equilibrium at E producing OS level of output. In the long run he can change the plant and will be in equilibrium at F where MR curve cuts LMC curve. The monopolist has increased his output from OS to OL and price has fallen from OP to OJ. Profits have also increased in the long run from TPQR to GHKJ.

18.4 PRICE DISCRIMINATION OR DISCRIMINATING MONOPOLY

Price discrimination refers to the practice of selling the same product at different prices to different buyers. Mrs. Robinson defines it as "charging different price for the same product or same price for differentiated product". Prof. Stigler defines price discrimination as "the scale of technically similar products at prices which are not proportional to Marginal costs".

Price discrimination may be divided into three types-personal, local and according to use. Price discrimination is personal when a seller charges different prices for different persons. For example, hair cut for children and adult. Price discrimination is local when the seller charges different prices for people of different localities. For instance, a seller

167

may charge one price at domestic market and another price in international market. Discrimination is according to use when the same commodity is put to different uses. For example, electricity is usually sold at a cheaper rate for industrial uses than for domestic purposes.

Degrees of price discrimination

Prof. A.C. Pigou has distinguished between three degrees of price discrimination.

1.   Price discrimination of the first degree.

2.   Price discrimination -of the second degree.

3.   Price discrimination of the third degree.

Price discrimination of the first degree

It is also known as perfect price discrimination. Price discrimination of the first degree is said to occur when the monopolist is able to sell each separate unit of the output at a different price. In other words, it involves maximum possible exploitation of each buyer. Price discrimination of the first degree is depicted in figure. 16.
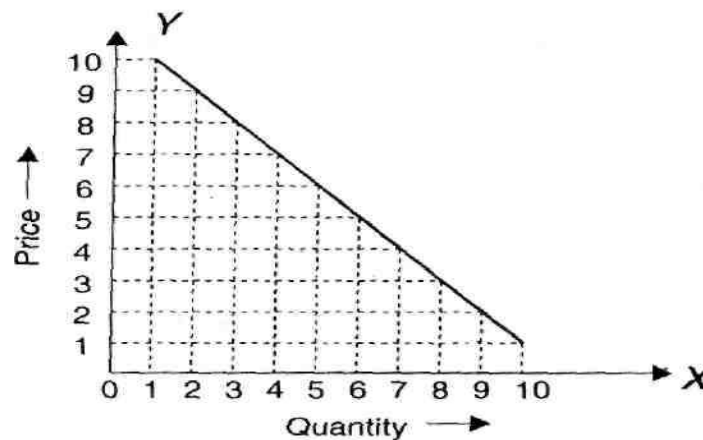

At price Rs. 10 the buyer will purchase one unit cf the good; at price Rs. 9 the buyer would purchase 2 units of the good; at price of Rs. 8 he would purchase 3 units of the good; at price of Rs. 7 he would take 4 units of the good and so on. Under simple monopoly, if the seller fixes the price at Rs. 7 the buyer buys 4 units then he would pay

168

Rs. 28 as the price for 4 units. By doing so, he gets a consumer surplus of Rs. 6. This is so because; the buyer is willing to pay Rs. 10 for the first unit, Rs. 9 for the second, Rs.8 for the third and Rs. 7 for the fourth. In all he is willing to pay Rs. 34. He actually pays only Rs. 28. But under price discrimination of the first degree the monopolist charges Rs. 34. As a result the buyer has no consumer's surplus.

Price discrimination of the second degree

In price discrimination of the second degree buyers are divided into different groups and from each group a different price is charged which is the lowest demand price of that group. This is shown in figure. 17.

Fig.17.
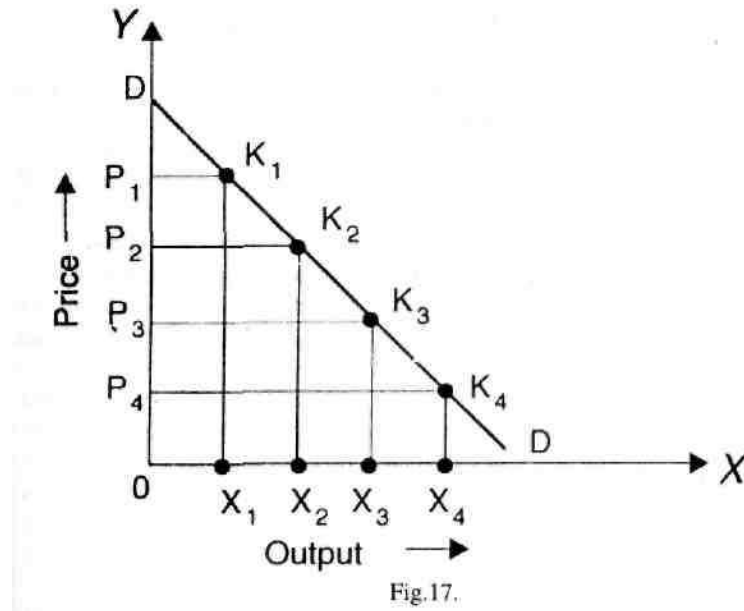
Market is divided into four groups. DD is the market demand curve. In the first group X units of output will be sold at a price of OP1. All the buyers in this group pay OP1 price and the group gets $DK_1 P_1$ as consumer's surplus. Similarly for other groups, consumers pay OP2, OP3, OP4 and get the consumer's surplus equal to DK2 P2, DK3 P3 and DK4 P4 respectively.

Price discrimination of the third degree

It occurs when the seller divides his buyers into two or more than two sub-markets or groups and charges a different price in each sub-market. The price charged in the sub-market need not be the lowest demand price of that sub-market..

169

Possibility of price discrimination

Price discrimination is possible in the following cases:

1   The nature of the commodity should be such as to enable the monopolist to charge different prices. This is possible only when there is no possibility of transference of the commodity from one market to the other. For example, doctors charge different fees for the rich and for the poor for same service.

1.   When the markets are separated by long distance or tariff, then price discrimination is possible. If the transportation cost is higher than the price difference between the two markets, one monopolist can charge different prices. For example, a commodity may be sold at Rs. 10 in Delhi and Rs. 20 in Madras. If the transportation cost between Delhi and Madras is greater than Rs. 10 it is not profitable for the consumers to transport the commodity from Delhi to Madras on their own. Similarly when domestic market is protected by tariff, the monopolist can sell the product at a lower price in the foreign market and at a higher price in the domestic market.

2.   In certain cases, the firms have a legal sanction for price discrimination. For example, electricity board charges a lower price for industrial purposes and a higher price for domestic purposes. Similarly, transportation companies charge different fares for different classes of passengers.

3.   Price discrimination is possible due to preferences or prejudices of the consumers. Different prices are charged for different varieties although they differ only in label or name. Upper class people may prefer to buy in fashionable quarters to buy in a congested, ugly and cheaper locality.

4.   Price discrimination may become possible due to ignorance and laziness of buyers. If a seller is discriminating between two markets but the buyers are ignorant that the seller is selling the product at a lower price in another market, price discrimination is possible. Price discrimination is also possible if the buyers are aware that the seller is selling the product at lower price in another market but due to laziness may not go for shopping, in the cheaper market.

5.   When a monopolist is able to meet different needs for his customers it is possible for him to follow price discrimination. For example, railways charge different rates for

carrying coal, cotton, silk and fruit even though the service rendered is the same for all.

6. A monopolist can easily charge discriminating prices when goods are being supplied to special orders. In such a case, there is no question of comparing prices by the buyers.

It is obvious that price discrimination can be practised only under imperfect competition. It is not at all possible when there is perfect competition. Under perfect competition, the seller has to take the market price as given. Therefore, there is no scope for price discrimination. The possibility of price discrimination under perfect competition exists only if all sellers are combined together. But as soon as they combine, perfect competition ceases to exist. Price discrimination can occur under conditions of imperfect or monopolistic competition. Larger the market imperfection, greater is the possibility of price discrimination. When there is monopoly, the market imperfection is maximum and the possibility of price discrimination is also maximum. Since, in case of a monopoly there are no other sellers selling the same product or its substitutes, the monopolist is in a position to charge different prices from different parts of the market.

Conditions for profitable price discrimination

The monopolist may be able to charge discriminating prices but it need not necessarily be profitable for him. It is only when the elasticity of demand in one market is different from the elasticity of demand in the other market that the monopolist will find the policy of price discrimination profitable. The monopolist will find it profitable to charge more in the market where elasticity is low and low price where it is high. Mrs. Robinson says, "The submarkets will be arranged in ascending order of their elasticities, the highest price being charged in the least elastic market, and the lowest price in the most elastic market".

Same elasticity of demand in two markets

If the elasticity of demand is same in two markets, the marginal revenues in two markets at every price of the product will also be the same and it will not be profitable for the monopolist to discriminate between the two markets. This is illustrated in figure 18.

171
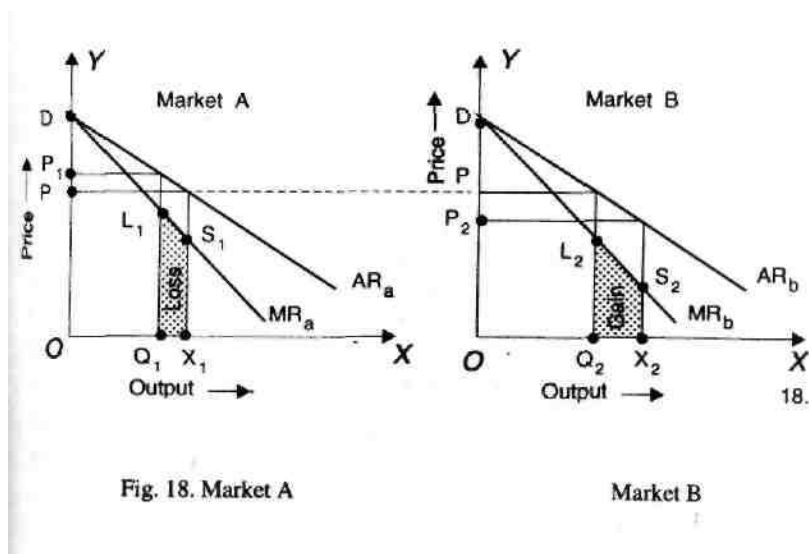
Fig. 18. Market A   Market B

ARa and ARb are the iso-elastic demand curves of the markets A and B. At price OP marginal revenue in the two markets is the same. If the monopolist transfers a given amount from one market te another and thereby charge different prices, it would not be profitable for the monopolist. Suppose, he reduces his sales in market A from OX to OQ_1 and transfer it to market B, where the sales go up from OQ2 to OX2. As a result of reduced sales in market A, the monopolist loses Q1 X1 S1 L1 while he gains Q2 X2 L2 S2 in market B by increasing his sales. Since the loss is greater than the gain, it is not profitable for the monopolist to discriminate prices between the two markets having the same elasticity of demand.

Elasticity of demand differs in two markets

If the monopolist wants to maximum profits, he must discriminate prices if the elasticities of demand in the two markets at the given monopoly prices are different. This is shown in Figure 19.
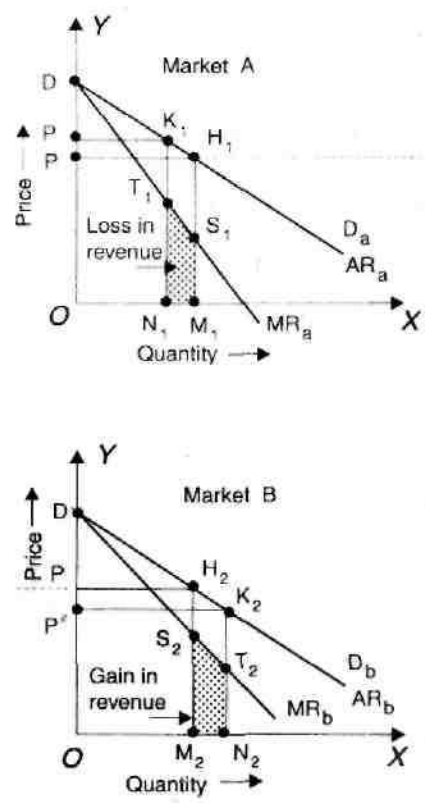
Fig. 19.

The monopolist reduces the output in market B and transfers it to market A. When he increases his sales in market A from OX to OQi, he gains Xi Qj L\ S\ and when he reduces it in market B his sales go down from OQ2 to OX2, he loses X2 Q2 L2 S2. Since the gain is more than the loss it is profitable for the monopolist to follow price discrimination.

18.5 Price-output determination under discriminating monopoly

The graphical representation of price-output determination under conditions of discriminating monopoly can be shown with the help of a figure.

There are two markets A and B with different price elasticities. The price elasticity in market B is lower than that in market A.

Fig. 20

The total marginal revenue arising from the two markets is arrived at by horizontal summation of the marginal revenue curves for the two sub-markets. Da is the demand curve and MRa is the marginal revenue curve in market A. Similarly, MRb is the marginal revenue curve in market B corresponding to the demand curve D. AMR is the aggregate marginal revenue curve, which has been derived by adding MRa and MR5 . MC is the marginal cost curve of the monopolist.
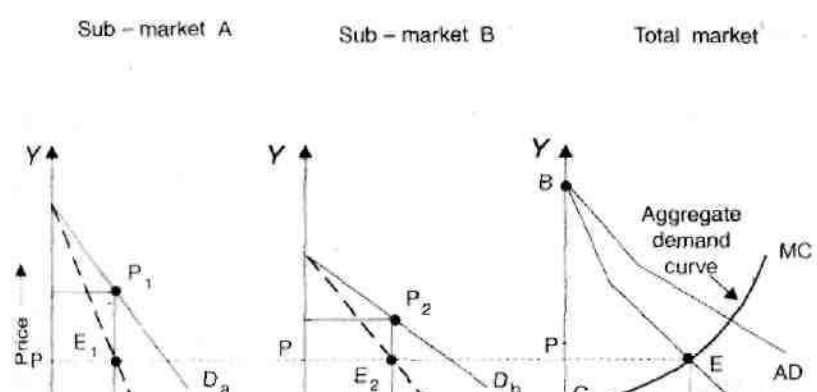
The discriminating monopolist will maximise his profits by producing that level of output at which MC intersects AMR. Thus he will be producing OM level of output. This total output will be distributed in such a way that marginal revenues in two markets are equal and at the same time it should be equal to the marginal cost. Since marginal cost is ME, the total output OM has to be distributed in such a way that the marginal revenue in two markets should be equal to the marginal cost. Hence OM amount can be sold in market A and OM2 in market B. Further, OM amount can be sold in market A at $M_1 P_1$ price and OM2 can be sold in market B at M2 P2 Price. Price is higher in market A where the demand is less elastic than in market B where the demand is more elastic. Thus a profit maximising monopolist charges different prices and supplies different quantities in the sub- markets having different price elasticities.

18.6 Equilibrium under price discrimination in the case of dumping

A special case of price discrimination is one in which a producer sells in two markets, one under conditions of perfect competition and another under the conditions of monopoly. Such a situation occurs when a producer sells his product in domestic market

in which he is a monopolist and also in the world market which is perfectly competitive. Equilibrium in such a case is shown in figure 21.

In the domestic market in which the producer has a monopoly average revenue curve ARH slopes downwards. In the world market in which there is perfect competition, the demand curve is perfectly elastic the average revenue curve ARW is horizontal and MR curve coincides with it. MC is the marginal cost curve. Aggregate marginal revenue curve is BFED which is the summation of MRH and MRW. MC intersects the aggregate marginal revenue curve at E and the equilibrium level of output is OM. This total output OM has to be distributed between domestic market and world market in such a way that marginal revenue in each market is equal to each other and to the marginal cost. Therefore, OR will be sold in the domestic market at the price of OP^ and RM will be sold in the world market at price OPw. Total profit earned by the producer is CEFB. Price in the world market is lower than the price in the home market. When a producer charges a lower price in, the world market than in the home market, he is said to be dumping in the world market.

18.7 Monopoly equilibrium Vs Competitive equilibrium

The only similarity between the two is that a firm is in equilibrium at the level of output at which marginal revenue is equal to marginal cost. But there are many differences:

1. Under perfect competition, the average revenue curve is horizontal straight line parallel to the X axis. Therefore, MR is equal to AR at all levels of output and MR curve coincides with AR curve. But under monopoly, AR is sloping downwards. Hence, MR is less than AR at all levels of output and MR curve lies below the AR curve. In equilibrium the marginal revenue will be smaller than the average revenue.

175
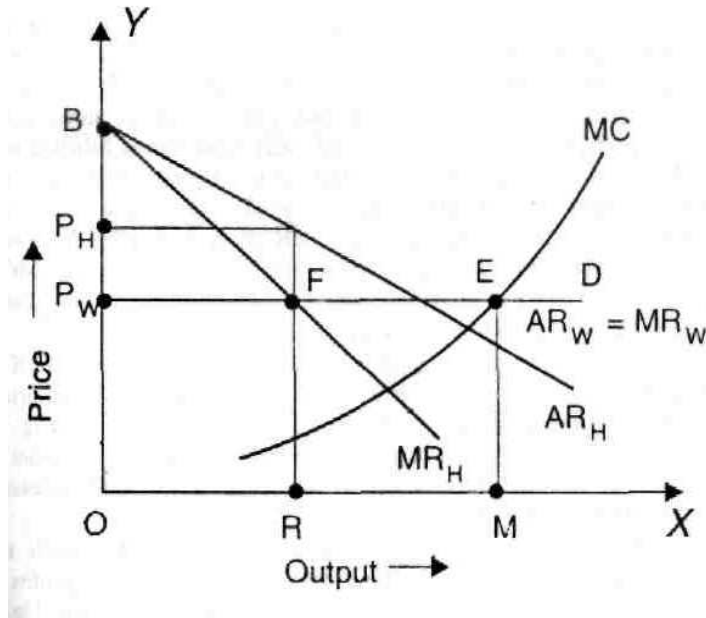
Fig. 22

2. Both under perfect competition and monopoly, the firm is in equilibrium where MC is equal to MR. But in perfect competition, when MC is equal to MR, it is also equal to price or AR. This is not so in case of monopoly. Under monopoly, MR is less than AR or price; in equilibrium MC will be equal to MR but it will be less than price. Therefore, in perfect competition, price is equal to MC and in monopoly price is higher than the marginal cost.

3. Another significant difference between the two is that whereas a perfectly competitive firm is in long-run equilibrium at the minimum point of the long-run average cost curve, monopolistic firm is in equilibrium at the level of output where average cost is still declining and has not yet reached its minimum point. Under perfect competition, it pays the firm to expand production so long as the average cost is falling since AR and MR remain constant. But it does not pay a monopolist firm to expand production to the minimum of AC curve.

4. Another important difference between the two is that while under perfect competition equilibrium is possible only when MC is rising at the point of equilibrium, but monopoly equilibrium can be reached whether marginal cost is

176

rising, remaining constant or falling at the equilibrium output. This is so because the second order condition of equilibrium namely MC curve should cut MR curve from below at the equilibrium point, can be satisfied in monopoly in all the three cases, whereas in perfect competition the second order condition is fulfilled only when MC curve is rising. Since in perfect competition the MR curve is a horizontal straight line, MC curve can cut the MR curve from below only when MC is rising. But under monopoly MR curve is sloping downward and therefore, MC curve can cut the MR curve from below whether MC is rising, remaining constant or falling. The equilibrium of the monopolist in these three cases is shown in Figure 22. Fig. A illustrates the equilibrium of the monopolist when MC is rising at the equilibrium output. Fig. B shows the monopoly equilibrium when MC is constant at and near the equilibrium output. In Fig. C, monopolist is in equilibrium when MC is falling at and near the point of equilibrium. In all these three cases, OP represents price, OM represents output and RNQP represents profit.

5. Still another difference between the two is that while the perfectly competitive firm in the long run, earns only normal profits, a monopolist can make supernormal profits even in the long run. Under perfect competition, if firms in the short run are making supernormal profits, the new firms will enter the industry to compete away the profits. But under monopoly, the firm continues to earn supernormal profits even in the long run since there are strong barriers to the entry of new firms in monopoly. It does not mean that the monopoly always guarantees supernormal profits. If the demand and cost conditions are not favourable, the monopolist may suffer short run losses, as shown in the figure. 23.
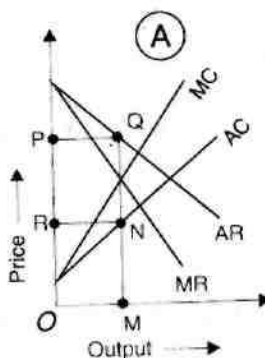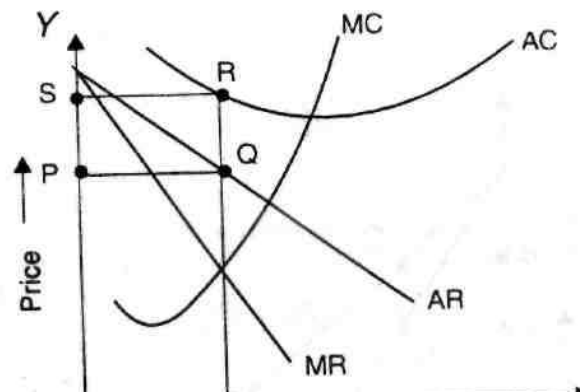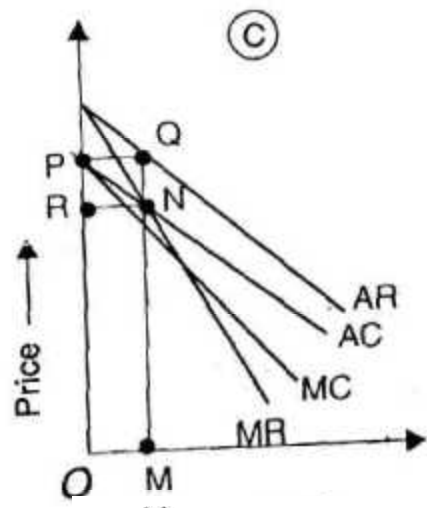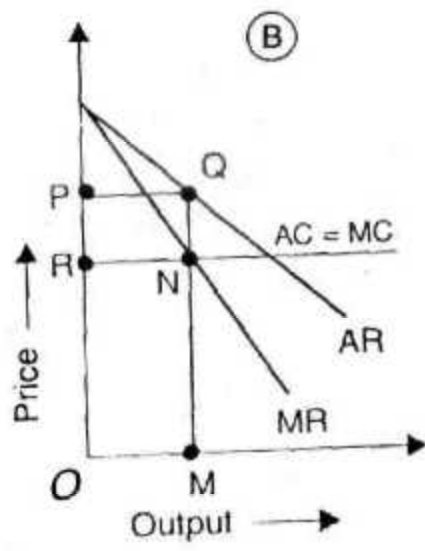
6. Another important difference between monopoly equilibrium and perfectly competitive equilibrium is that under monopoly, price is higher and output smaller than under perfect competition. Price-output level under perfect competition and monopoly is shown in figure. 24.
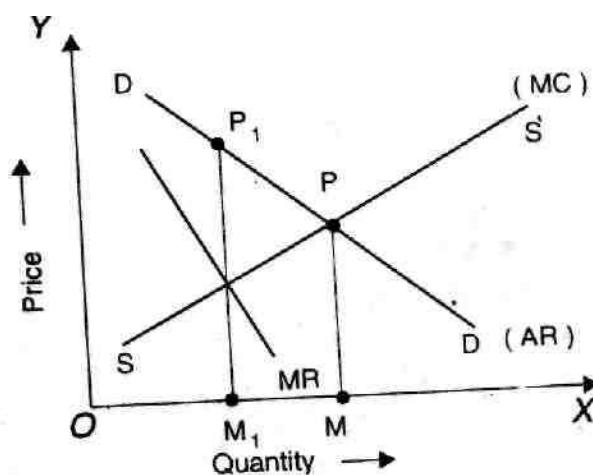
DD and SS are demand and supply curves of the perfectly competitive industry. The two curves intersect each other at P. Therefore, under perfect competition, price is MP and output is OM. Under monopoly, SS will be the marginal cost curve, MR curve cuts MC curve determining the monopoly price at $M_1 P_1$ and monopoly output at OM_1. Thus monopoly has resulted in a higher price and a lower output. Thus monopoly restricts output to raise price.

7. Another significant difference between monopoly and perfect competition is that a monopolist can charge discriminatory prices for his goods but a firm operating under perfect competition cannot. Under perfect competition, the price is fixed by the market and the producer cannot exercise any control over it. The question of charging different

prices from different set of customers does not arise. On the other hand, a monopolist finds price discrimination both possible and profitable. For this purpose, he splits the market for his goods into sub markets on the basis of elasticity of demand. Under perfect competition the demand curve is perfectly elastic. But under monopoly the demand curve is relatively inelastic. Therefore he can charge different prices in different parts of the market.

18.8 CONCENTRATION OF ECONOMIC POWER

Concentration of economic power manifests in the form of monopolistic and restrictive practices. "Every practice whether it is by action or understanding or agreement, formal or informal, to which persons enjoying monopoly power resort in exercise of the same to reap the benefits of that power and every action, understanding and agreement tending to or calculated to preserve, increase or consolidate such power should properly, be designated monopolistic practice" (Monopolies Inquiry commission). The term restrictive practice implies "Practices other than those pursued by monopolists which obstruct the free play of competitive forces or impede the free flow of capital or resources into the stream of production or of the finished goods in the stream of distribution at any point before they reach the hands of the ultimate consumers". These two types of manifestation he come the tools for economic concentration.

Types of concentration

There are two types of concentration viz., product-wise concentration and country-wise concentration. When production and distribution of any particular commodity or service is in a single concern or comparatively limited number of concerns or a fairly large number of concerns controlled by a single family or a few families or business houses by reason of ownership of capital or otherwise, it is product-wise concentration. When a large number of concerns engaged in the production and distribution of different commodities are controlled by one individual or group of persons or families, whether incorporated or not, by reasons of financial or business interests, it is country-wise concentration. If the share of the three top producers of a particular product is 75 percent or more, then concentration is high. Products with high concentration are infant milk food, kerosene, stoves, dry batteries, tooth paste, talcum powder etc. If the

180

share of the three top producers is more than 60 percent but less than 75 percent, concentration is regarded as medium. Medium concentration existed in the production of biscuits, bicycles, cement, electric fans etc. Concentration is considered to be low where the share is more than 50 percent but less than 60 percent e.g. Woollen fabrics, pencils, knitting yarn etc. Where the share of the three top enterprises is less than 50 percent, concentration is nil. e.g. Tea, coffee, coal, textiles, sanitary- wares etc.

Country wise concentration also known as inter-industry concentration refers to those concerns which are subject to the ultimate and decisive decision-making power of the controlling interest in the group. The groups do not confine to a single product but produce a number of diverse commodities.

Causes of concentration

An important cause for concentration of economic power is inter-company investment along with interlocking of directorship. Managing agencies also fostered the process of concentration of economic power by providing capital and managerial skill. The major responsibility for the growth of concentration lies with the government. The government promoted the growth of private industry through tax incentives and foreign exchange allocations. The planned economy with a system of industrial licensing, control of capital issues, regulation of imports, exchange control has led to further concentration. Another important factor for growing concentration is the nature of the working of banks and financial institutions. The bank deposits were used for financing large industries. Similarly 56 percent of the total financial assistance of public sector financial institutions had gone to the large industrial houses.

Effects of concentration

Concentration of economic power has fostered economic growth. It promoted capital formation. It also supplied managerial skill of high quality in abundance and as a result production increased. Inspire of all these, concentration of economic power prevented the entry of small and rival competitors, resulted in the deterioration of quality of products, and paved the way for corrupt officials and politicians. It hindered the growth of managerial class. It created imbalance in the distribution of national wealth and income. Concentration of economic power has resulted in misdirection of investment. In

181

those sectors where the rate of return is low and slow, capital is scarce. In those areas where the return is high and quick, investment flows in abundance.

Measurement of concentration

The technique of measuring the concentration of economic power is an under-developed art. However, concentration may be measured by finding the aggregate share of the largest producing corporations in the nation's facilities, markets, labour force or income. To Berle and Means, "Concentration was an index of oligopoly in the economy and it showed the extent to which a few executives had irresponsible control over a large proportion of nation's productive plant-irresponsible in the sense of being beyond the control of market forces". These executives enjoyed some non-market controls also. With such concentration, allocation of resources is performed not by the price mechanism but by the policies of a relatively few men who possess industrial power. Another way or measuring concentration of economic power is by studying the proportion of net fixed assets held by the largest firms. We can also measure economic power by a product-by-product analysis of oligopoly in industry. The most famous statistical device used for this purpose is the concentration ratio, which is the percentage of total output of any commodity either in value or physical terms, made by its four largest producers. The Federal Trade Commission (U.S.A) used new statistical concept to study whether concentration is an inevitable consequence of modern technology or not. The new concept measures the spread between company concentration (the proportion of total output produced by the few biggest companies), and plant concentration (the proportion produced by the few biggest plants). When the company shares too large a spread over plant, the size of the bigger firms must be attributed to circumstances other than technological economics of mass production.

Yet another measure of concentration is Herfindahl index. For example the total amount of loans sanctioned by a financial institution to different industrial units has been taken into account to find out whether there is a tendency for the loans to flow only to the larger units.

182

Table 1. Herfindahl Measure of concentration

Quantum of loans (Rs. in Lakhs)	No. of units	Amount (Rs. in lakhs)	Share in total amount Si	Si^2
40 and above 30	30	1500	0.12	0.014
— 40	20	600	0.05	0.003
20 — 30	50	1500	0.12	0.014
10 — 20	100	1400	0.11	0.012
5—10	300	1900	0.15	0.022
1—5	1900	4500	0.36	0.129
Less than 1	1800	1100	0.09	0.008
Total	4200	12500	-	0.202

$$Si = \frac{Amount\ in\ particular\ category}{Total\ of\ column\ 3}$$

Herfindahl index of 0.202 indicates that there is no concentration and there is an even distribution of loans.

Kindlcbcrger has given a measure of concentration of economic power at the international level. If a group of nations were to form a cartel, as the Organisation of Petroleum Exporting Countries did, they will extract maximum profits from its buyers. Their ability to do is proportional to the elasticity of world demand for their exports. The elasticity of demand depends on factors like elasticity of demand for cartel's product, elasticity of competing supply and share of the world market.

Symbolically it can be written as

$$dc = \frac{d - So(I - C)}{C}$$

Where 'dc' stands for elasticity of demand,'d' for world demand for the product, 'So' for supply of the product and 'c' for share of the world market.

Control of concentration of economic power

Monopolies Inquiry Commission was appointed in April 1964 to examine the problem of concentration and to suggest suitable measure to control the same. On the

basis of the recommendations of the Monopolies Inquiry commission, Monopolies and Restrictive Trade Practices Act was passed in 1969. Under this Act, a permanent statutory commission known as Monopolies and Restrictive Trade Practices Commission was set up to investigate and control monopolies and restrictive trade practices. It has drawn a distinction between monopolistic and restrictive trade practices. Monopolistic trade practices refer to the behavior c" an individual firm or an oligopolistic group of not more than three firms which are able to control the market by regulating prices or output or eliminating competition.

Restrictive trade practices refer to the action undertaken by a group of two or more firms to avoid competition regardless of whether the market share of the member firms is or is not dominant. The commission will perform two main functions investigation and control of monopolies and restrictive trade practices. The Act also provides for the appointment of two officials, the Director of Investigation and the Registrar of Restrictive Trade Practices to assist the commission in its work.

On August 2, 1970, the government set up a three-man monopolies commission to prevent concentration of economic power, for controlling monopolies and for prohibiting monopolistic and restrictive trade practices by controlling the activities of dominant undertakings. A dominant undertaking is one which either by itself or with inter-connected undertaking, controls not less than one-third of items of production, supply or distribution of a commodity. The Act also defines a monopolistic undertaking as any dominant undertaking which by itself or together with not more than two other independent undertakings, supplies or distributes or otherwise controls not less than one-half of total goods or services.

The first amendment to MRTP Act was introduced in November 1981 and the second amendment in August 1982. The amendment revised the definition of a dominant undertaking. In the revised definition the term production refers to the amount of goods produced by a dominant undertaking for the domestic market i.e. production minus export of that good.

MRTP Act was further amended in 1984 to include investment companies under its purview. It also introduced a new concept of 'Group' to include enterprises under the

184

same management. The amendment also widened the scope of MRTP Act by redefining an undertaking so as to include companies dealing in goods and services, stocks and shares and investment companies. The Amendment Act has removed the concept of monopolistic undertaking because monopolistic practices can exist even without monopolistic undertakings.

The Industrial Policy (1991) states that "The interference of the government through the MRTP Act in investment decisions of large companies has became deleterious in its effects on Indian industrial growth. The pre-entry scrutiny of investment decision by so called MRTP companies will no longer be required. Instead, emphasis will be on controlling and regulating monopolistic, restrictive and unfair trade practices rather than making it necessary for the monopoly houses to obtain prior approval of Central Government for expansion, establishment of new undertakings, merger, amalgamation and takeover and appointment of certain directors. The thrust of policy will-be more on controlling unfair or restrictive business practices".

The success of the government controlling concentration depends on the extent to which it can generate competitive elements and control monopolistic tendencies.

18.9 MONOPOLISTIC COMPETITION

Perfect competition and monopoly are rarely found in the real world. Therefore, professor Edward. H. Chamberlin of Harvard University brought about a synthesis of the two theories and put forth, "Theory of Monopolistic Competition" in 1933. Monopolistic competition is more realistic than either pure competition or monopoly. It is a blending of competition and monopoly. "There is competition which is keen though not perfect, between many firms making very similar products". Thus monopolistic competition refers to competition among a large number of sellers producing close but not perfect substitutes.

FEATURES

1.   Large number of sellers

In monopolistic competition the number of sellers is large. No one controls a major portion of the total output. Hence each firm has a very limited control over the price of the product. Each firm decides its own price-output policy without considering

185

the reactions of rival firms. Thus there is no interdependence between firms and each seller pursues an independent course of action.

2.   Product differentiation

One of the most important features of monopolistic competition is product differentiation. Product differentiation implies that products are different in some ways from each other. They are heterogeneous rather than homogeneous. There is slight difference between one product and others in the same category. Products are close substitutes but not perfect substitutes. Product differentiation may be due to differences in the quality of the product. Product may be differentiated in order to suit the tastes and preferences of the consumers. The products are differentiated on the basis of materials used, workmanship, durability, size, shape, design, colour, fragrance, packing etc. Products are differentiated in order to promote sales by influencing the demand for the products. This can be achieved through propaganda and advertisement. Advertisement brings a psychological reaction in the minds of the buyers and thus influences the demand. In addition, location of the shop, its general appearance, counter service, credit and other facilities increase sales.

Patent rights and trade marks also promote product differentiation. Kodak and Coca Cola are the examples of patent rights. Trade marks like Hamam, Rexona, Lux etc. help the consumers to differentiate one product over others.

3.   Free entry and exit of firms

Another feature of monopolistic competition is the freedom of entry and exit of firms. Firms under monopolistic competition are small in size and they are capable of producing close substitutes. Hence they are free to enter or leave the industry in the long run. Product differentiation increases entry of new firms in the group because each firm produces a different product from the others.

4.   Selling cost

It is an important feature of monopolistic competition. As there is keen competition among the firms, they advertise their products in order to attract the

186

customers and sell more. Thus selling cost has a bearing on price determination under monopolistic competition.

5. Group equilibrium

Chamberlin introduced the concept of group in the place of industry. Industry refers to a number of firms producing homogeneous products. But, firms under monopolistic competition produce similar but not identical products. Therefore, chamberlin uses, the concept of group to include firms producing goods which are close substitutes.

6. Nature of demand curve

Under monopolistic competition, a single firm can control only a small portion of the total output. Though there is product differentiation, as products are close substitutes, a reduction in price leads to increase in sales and vice-versa. But it will have little effect on the price-output conditions of other firms. Hence each will loose only few customers, due to an increase in price. Similarly a reduction in price will increase sales. Therefore the demand curve of a firm under monopolistic competition slopes downwards to the right. It is highly elastic but not perfectly elastic. In other words, under monopolistic competition, the demand curve faced by the firm is highly elastic. It means that it has some control over price due to product differentiation and there are price differentials between the firms.

18.10 Price-Output Determination under Monopolistic Competition

Since, under monopolistic competition, different firms produce different varieties of products, prices will be determined on the basis of demand and cost conditions. The firms aim at profit maximisation by making adjustments in price and output, product adjustment and adjustment of selling costs.

Equilibrium of a firm under monopolistic competition is based upon the following assumptions:

1.   The number of sellers is large and they act independently of each other.

2.   The product is differentiated.

3.   The firm has a demand curve which is elastic.

4.   The supply of factor services is perfectly elastic.

5.   The short run cost curves of each firm differ from each other.

6.   No new firms enter the industry.

Individual Equilibrium and Price Variation

Based on these assumptions, each firm fixes such price and output which maximises its profit. Product is held constant. The only variable is price. The equilibrium price and output is determined at a point where the short run marginal cost equals marginal revenue. The equilibrium of a firm under monopolistic competition is shown in figure 25.

DD is the demand curve of the firm. It is also the average revenue curve of the firm. MC is the marginal cost of the firm. The firm will maximise profits by equating marginal cost with marginal revenue. The firm maximises its profit by producing OM level of output and selling it at
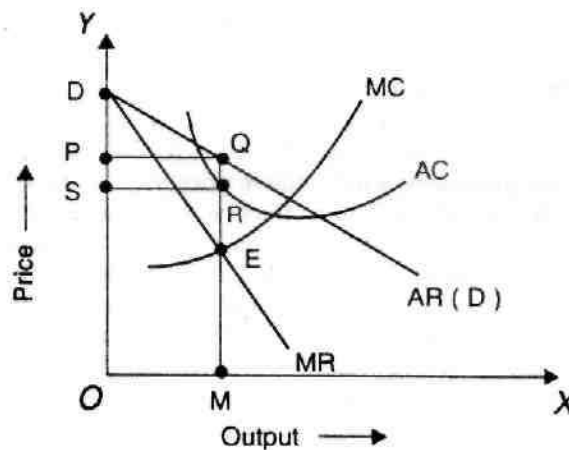

Fig. 25

a price of OP. The profit earned by the firm is PQRS. Thus in the short run, a firm under monopolistic competition earns supernormal profits.

In the short run, the firm may incur losses also. This is shown in figure 26.
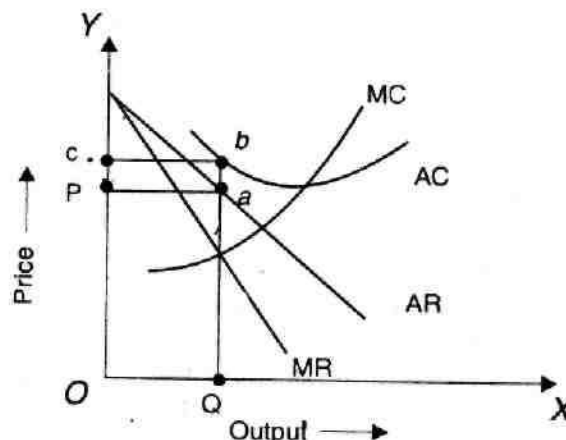
Fig. 26

The firm is in equilibrium by producing an output of OQ. It fixes the price at OP. As price is less than cost, it incurs losses equal to pabc. Thus a firm in equilibrium under monopolistic competition may be making supernormal profits or losses depending upon the position of the demand curve and average cost curve.

Group Equilibrium and Price Variation

Group equilibrium refers to price-output determination in a number of firms whose products are close substitutes. The product of each firm has special characteristics. The difference in the quality of the products of the firms under monopolistic competition results in large variation in elasticity and position of the demand curves of the various firms. Similarly the shape and position of cost curves too differ. As a result there exist differences in prices, output and profits of the various firms in the group. For the sake of simplicity in the analysis of group equilibrium, Chamberlin ignores these differences by adopting infirmity assumption. He assumes that the cost and demand curves of all the products in the group are uniform. Chamberlin introduces another assumption known as 'symmetry assumption'. It means that the number of firms under monopolistic competition is large and hence the action of an individual firm regarding price and output will have a negligible effect upon his rivals.

Based on these assumptions, short run equilibrium of a firm under monopolistic competition can be shown in Figure. 27.
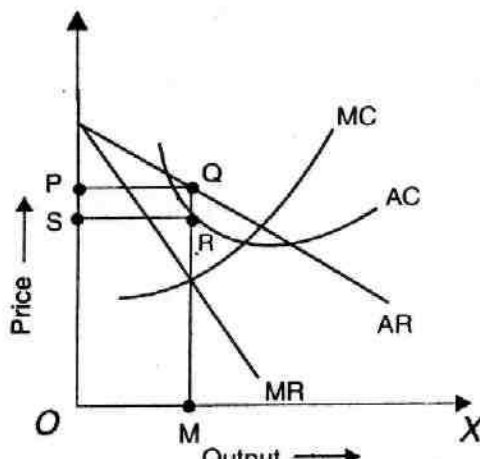
Figure (A) represents short run equilibrium and figures (B) the long run equilibrium. In the short run, the price is OP and average cost is only MR. Hence there is supernormal profit equal to PQRS. But in the long run, as shown in figure 27 (B), the excess profit is competed away. MC = MR at OM level of output. LAR is tangent to LAC. Price is equal to average cost and there is no extra profit. Only normal profit is earned.
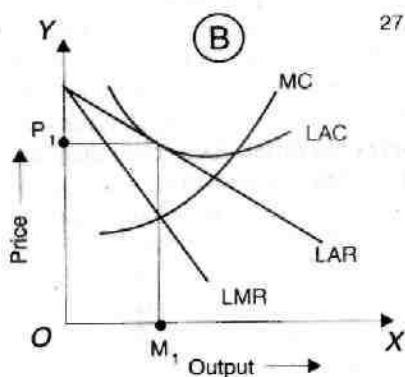
18.11 PRODUCT DIFFERENTIATION

While analysing the equilibrium of a firm with regard to the variation of the product we assume the price of product to be constant. The firm has to select among the various possible qualities and attributes of the product. An important characteristic of product variation is that it changes the cost curve and demand for the product. Therefore, the entrepreneur has to choose the product whose cost and demand are such as to yield maximum profit. Yet another feature of product variation is that product variation is qualitative and therefore, quantitative measurement is not possible.

INDIVIDUAL EQUILIBRIUM AND PRODUCT VARIATION

The equilibrium of the firm under condition of product variation is shown in figure 28.

190
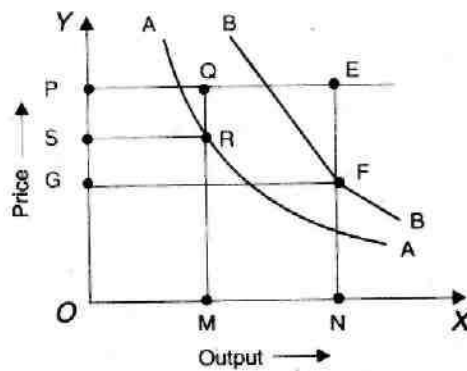
Fig. 28.

AA is the average cost curve of the product A and BB is the average cost curve of the product B. The price of the product is OP. If OM quantity of the product A is demanded at the price of OP, the total costs are OMRS. The entrepreneur earns an abnormal profit equal to PQRS. If the Quantity demanded of the product B is ON, then the total costs are ONFG and the total profits made by the entrepreneur are GFEP. Since the product B yields greater profits than A, the entrepreneur will select the product B.

Group Equilibrium and Product Variation

It is assumed that the demand is uniform and the possibility of product variation is also uniform. The equilibrium adjustment of the product is shown in figure 29.
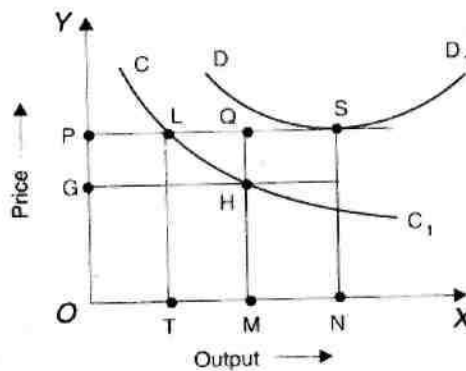
Fig. 29

CC1 is the average cost curve. If the quantity demanded is OM then the total cost-is OMHG. The firm earns supernormal profits equal to GHQP. This supernormal profits should be wiped away to achieve group equilibrium. Attracted by the supernormal profits, new competitor may enter the group. The quantity demanded will come down to OT.

191

Price will cover only cost of production. Besides, the adjustment in the number of firms, product improvement may also take place. When all entrepreneurs improve their product, cost will increase as shown by DD_1 and become equal to the price at the point S.

Group equilibrium must satisfy the following conditions:

1. The average cost must be equal to price.
2. It is not possible for any one to increase his profits by making further adjustment or improvement in his product.

Selling Cost and Price Determination

Selling cost is another important factor which influences pricing under monopolistic competition. Selling costs are costs incurred on advertising, publicity, salesmanship, free sampling, free service, door to door canvassing and so on. Selling costs are "the costs necessary to persuade a buyer to buy one product rather than another or to buy from one seller rather than another".

Under perfect competition, there is no need for advertising as the product is homogeneous. Similarly, under monopoly also, selling costs are not needed as there are no rivals. But under conditions of monopolistic competition, as the products are differentiated, selling costs are essential to increase sales. Chamberlin defines selling cost,"as costs incurred in order to alter the portion or shape of the demand curve for a product".

Advertisement may be classified into two types: informative and competitive. Informative advertisement enables the buyers to know about existence and uses of the product. It also helps to increase sales of all firms in the group. Competitive advertisement refers to expenses incurred to increase the sales of the product of a particular firm as against other products.

Production cost versus selling cost

Though Watson feels that it is difficult to differentiate selling cost from cost of production, Chamberlin states that these two costs are basically different from one another. Production costs include all expenses incurred in producing a product and transporting it to its destination for consumers. Selling costs are incurred to change the preferences of a consumer for a particular product. Prof. Chamberlin distinguishes between the two in these words: "The former (production) costs create utilities in order that demands may be satisfied; the latter create and shift the demand curves themselves." Those which alter the demand curve for a product are selling costs and those which do not are production costs. In other words, "those made to adapt the product to the demand arc production costs and those made to adapt the demand to the product are selling costs". The production cost affects the supply but selling cost affects the demand. While the production cost influences the volume of production, the selling cost influences the volume of sales.

Selling costs are subject to varying returns. When selling cost , increases, first it leads to increasing returns and then to diminishing returns. Two factors are responsible for increasing returns.

1. Repeated and continuous advertisements bring in increasing returns. Advertisement seen once will have negligible or no effect on consumer. Therefore, selling cost is a waste. Continued advertising over a period of time and in different media brings favourable effect.

 2. Economies of large scale selling operations also lead to increasing returns.

But as advertising outlay increases, diminishing returns set in due to change in taste and preferences of the people. Further, existing buyers may not increase their demand as a result of advertisement. This is because as he buys more, utility falls. The effect of selling costs on the demand for the product and the varying returns is shown in figure 30.
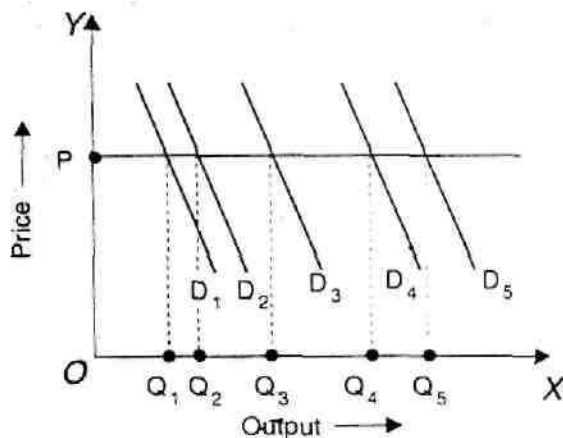
Fig. 30.

D1 is the demand curve before advertisement expenditure is incurred. When advertisement expenditures are undertaken, the demand curve shifts to D2 D3 D4 and D5. At the price of OP, quantity demanded increases from Ql toQ2, Q2 to Q3 Q3 to Q4and Q4 to Q5. After D4, diminishing returns occur.

The curve of selling cost is U-shaped, due to-the operation of the law of variable proportions. The curve of selling cost first falls, reaches a minimum point and then starts rising as shown in figure 31.

SC is the curve of selling costs. The total cost of selling OA units of the product is OAQS. At the minimum point of the selling cost curve i.e. at M, the selling cost is the minimum. Beyond the point M, selling cost increases. For instance, the average selling cost of OC is RC.

Individual Equilibrium and Selling Cost

Here it is assumed that the seller adjusts his selling cost keeping the price and product constant. It is also assumed that one seller alone advertises, while all others do not.

As a result he attracts new buyers, sells more and makes profit. This is illustrated in figure 32.
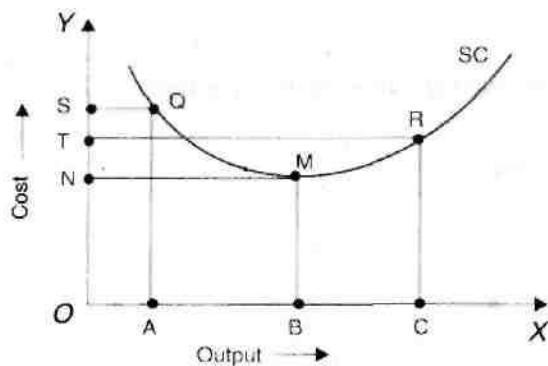
Fig. 31.
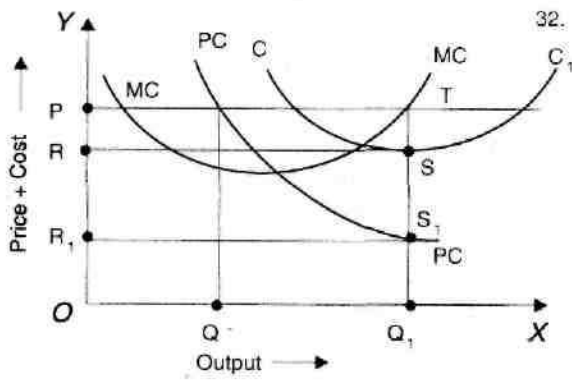
Fig. 32

PC is the production cost curve. CC_1 is the combined production and selling cost curve. MC is the marginal cost curve. If the seller sells OQ level of output at OP price, he has no profit. His cost of production is equal to price. Therefore, he advertises his product which increases his cost. His combined production and selling costs are indicated by CC_1. At OQ_1 level of output, his production cost is equal to $OQ_1 S_1 R_1$. His selling cost is $R_1 S_1$ SR. He earns an abnormal profit equal to PRST.

Group Equilibrium and Selling Cost

The abnormal profit earned by the firm makes all other firms in the group advertise. When all firms advertise total cost of all will increase. Price will be equal to cost. There is no abnormal profit. All firms earn only normal profit. This is shown in figure 33.

195
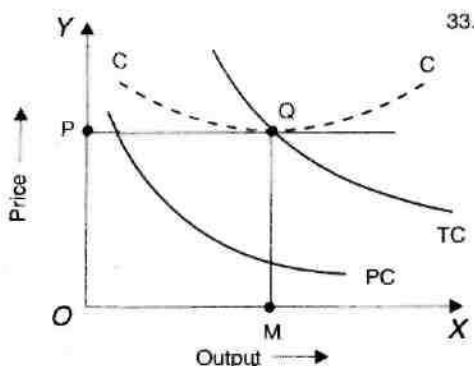
Fig. 33

PC is the production cost curve. TC is the total cost curve of the single firm. Due to competition from others, the cost is equal to price. CC is the total cost curve of all the firms in the group. As it is tangent to the price, there is no abnormal profit.

Optimum Selling Costs

A producer undertakes advertisement only when it brings additional revenue. The producer will increase his advertising expenditure as long as the marginal revenue is greater than marginal cost. He will stop at the point at which marginal revenue is greater than marginal cost. He will stop at the point at which marginal revenue is equal to marginal cost. Only at that point, profit will be maximum. This is shown in figure 34.

AR_1 is the average revenue curve before advertisement. AC is the average cost curve. OP is the price. The equilibrium level of output is OQ. If advertisement is undertaken, average revenue curve will shift from AR_1 to AR2 The average cost curve AC_1 includes the cost of advertisement. The equilibrium price will be OP_1 and the output OQ_1 Profits will be larger. Since profits have increased the firm will continue its advertisement

196
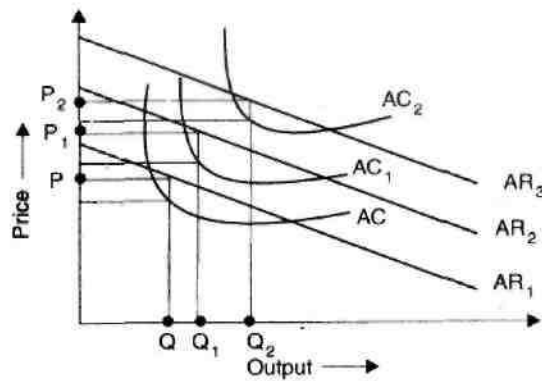
expenditure till the marginal revenue is equal to marginal cost. Profit maximisation is achieved at OP2 price and OQ2 output. Beyond this point, advertisement expenditure will lead to fall in profit. Therefore, a producer under monopolistic competition has to select that cost and revenue curves where the profits are maximum.

18.12 LET US SUM UP

In the first part of this lesson we have studied about the market forces operating in monopoly competition, the pricing and output decision in this market structure. We also discussed the concept of price discrimination and its effect at various degrees. Concentration of economic power is also widely studied in this part.

The second part of this lesson deals with monopolistic competition. We have studied its features, its price-output determination in an extensive manner. The concept of product differentiation in monopolistic competition is also discussed in the second part of this lesson.

18.13 LESSON-END ACTIVITIES

1. Explain about price discrimination How is price determined in a discriminating monopoly?

2. Explain the Price-output decision in a monopoly market

197

3. How does a firm take its pricing and output decisions under monopolistic competition?

18.14 REFERENCES

1. Peterson, Craig, H. and Lewis Cris, W. "Mangaerial Economic, Pearson, Education Asia.

2. Mehta, P.L., "Managerial Economics, Sultan Chand & Sons.

3. Maurise, Charles, S. Thomas and Others "Mangerial Economics applied Micro Economics for Decision Making, Irwin.

4. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics.

5. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

6. Sankaran, "Buseinss Economics.

7. McGuigan, Moyer and Harris: Managerial Economics, West Publishing Company

198

Lesson: 19-DUOPOLY AND OLIGOPOLY

CONTENTS

19.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To Understand the features of Duopoly and Oligopoly competition
- To know the various types of oligopoly
- To familiarize the various models of oligopoly behaviour

19.1 INTRODUCTION

The other forms of market situations, Duopoly and Oligopoly are dealt in this lesson. When there are few sellers of homogeneous or differentiated product, it is the oligopoly market structure. If there are only two sellers, it is a Duopoly market structure.

19.2 Duopoly

When there are two monopolists who share the monopoly power then it is called duopoly. It may be of two types-duopoly without product differentiation and duopoly with product differentiation.

Under duopoly without product differentiation, there are two monopolists selling an identical commodity. There is no product differentiation. There is also a possibility for

collusion. They may agree on price or divide the market for goods. Suppose, if there is no agreement between the two, a constant price war will emerge. In this case they will earn only normal profits. If their costs are different, the one with lower costs will squeeze out the other and a simple monopoly would result. The best course for the duopolists will be to fix the monopoly price and share the market and profits. In the. short run, duopoly price may be lower than the competitive price. In the long run, the price may.be somewhere between the monopoly price and the competitive price. When there is product differentiation, each producer will have his own customers. There is no danger of price war. There is no agreement. Since products are differentiated the firm with better product will earn supernormal profits.

19.3 OLIGOPOLY

Oligopoly is a situation in which few large firms compete against each other and there is an element of interdependence in the decision making of these firms. A policy change on the part of one firm will have immediate effects on competitors, who react with their counter policies.

Features

Following are the features of oligopoly which distinguish it from .other market structures :

1. Small number of large sellers.

The number of sellers dealing in a homogeneous or differentiated product is small. The policy of one seller will have a noticeable impact on market, mainly on price and output.

2.   Interdependence.

Unlike perfect competition and monopoly, the oligopolist is not independent to take decisions. The oligopolist has to take into account the actions and reactions of his rivals while deciding his price and output policies. As the products of the oligopolist are close substitutes, the cross elasticity of demand is very high.

3.   Price rigidity.

Any change in price by one oligopolist invites retaliation and counter- action from others, the oligopolist normally sticks to one price. If an oligopolist reduces his price, his rivals

will also do so and therefore, it is not advantageous for the oligopolist to reduce the price. On the other hand, if an oligopolist tries to raise the price, others will not do so. As a result they capture the customers of this firm. Hence the oligopolist would never try to either reduce or raise the price. This results in price rigidity.

4.   Monopoly element.

As products are differentiated the firms enjoy some monopoly power. Further, when firms collude with each other, they can work together to raise the price and earn some monopoly income.

5.   Advertising.

The only way open to the oligopolists to raise his sales is either by advertising or improving the quality of the product. Advertisement expenditure is used as an effective tool to shift the demand in favour of the product. Quality improvement will also shift the demand favorably. Usually, both advertisements as well as variations in designs and quality are used simultaneously to maintain and increase the market share of an oligopolist.

6. Group behaviour.

The firms under oligopoly recognise their interdependence and realise the importance of mutual cooperation. Therefore, there is a tendency among them for collusion. Collusion as well as competition prevail in the oligopolistic market leading to uncertainty and indeterminateness.

7.   Indeterminate demand curve.

It is not possible for an oligopolist to forecast the nature and position of the demand curve with certainty. The firm cannot estimate the sales when it decides to reduce the price. Hence the demand curve under oligopoly is indeterminate.

19.4 TYPES OF OLIGOPOLY.

Oligopoly may be classified in the following ways:

a. Perfect and imperfect oligopoly.

On the basis of the nature of product, oligopoly may be classified into perfect (pure) and imperfect (differentiated) oligopoly. If the products are homogeneous, then

oligopoly is called as perfect or pure oligopoly. If the products are differentiated and are close substitutes, then it is called as imperfect or differentiated oligopoly.

b. Open or closed oligopoly.

On the basis of possibility of entry of new firms, oligopoly may be classified into open or closed oligopoly. When new firms are free to enter, it is open oligopoly. When few firms dominate the market and new firms do not have a free entry into the industry, it is called closed oligopoly.

c. Partial and full oligopoly.

Partial oligopoly refers to a situation where one firm acts as the leader and others follow it. On the other hand, full oligopoly exists where no firm is dominating as the price leader.

d. Collusive and non- collusive oligopoly.

Instead of competition with each other, if the firms follow a common price policy, it is called collusive oligopoly. If the collusion is in the form of an agreement, it is called open collusion. If it is an understanding between the firms, then it is a secret collusion. On the other hand, if there is no agreement or understanding between oligopoly firms, it is known as non-collusive oligopoly.

e. Syndicated and organised oligopoly.

Syndicated oligopoly is one in which the firms sell their products through a centralised syndicate. Organised oligopoly refers to the situation where the firms organise themselves into a central association for fixing prices, output, quota etc.

19.5 MODELS OF OLIGOPOLY

1. Cournot's model of oligopoly : Augustin Cournot, a French economist, published his theory of duopoly in 1838. Cournot dealt with a case of duopoly. He has taken the case of two identical mineral springs

operated by two owners. His model is based on the following assumptions :

1.   The product is homogenous.

2.   There is no cost of production. The average cost and marginal cost are zero.

3.   Output of the rival is assumed to be constant.

4.   The market demand for the product is linear.

Cournot's solution
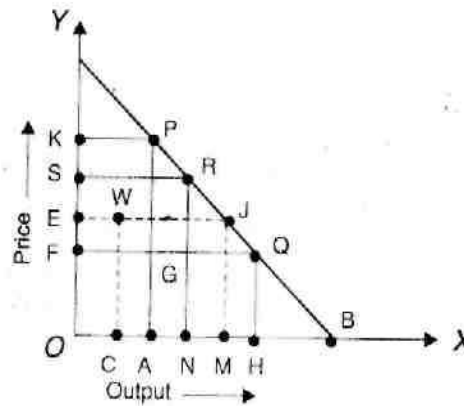
DB is the market demand curve. OB is the total quantity of mineral water which can be produced and supplied by the two producers. If both the producers produce the maximum quantity of OB, the price will be zero. This is because cost of production is assumed to be zero. Cournot assumes that one producer say X starts production first. He will produce OA output and his profit will be OAPK. Suppose the second producer Y enters into the market. He assumes that the first producer will continue to produce the same. So Y considers PB as his demand curve. With this demand curve, he will produce AH amount of output. The total output will now be OA + AH = OH and the price will fall to OF. The total profits for both the producers will be OHQR. Out of this total profits, producers X will get OAGF and Y will receive AHQG. Now that the profits of producers X are reduced from OAPK to OAGF by producers Y producing AH output, producer X will reconsider the situation. But he will assume that producer Y will continue to produce AH output. Therefore, he reduces his output from OA to OT. Now the total output will be OT + AH = ON and the price will be OS and the total profits of the two will be ONRS. Out of the total profits, X will get OTLS and Y will get TNRL. Now the producer Y will reappraise his situation. Believing that producer X will continue producing OT, the producer Y will find his maximum profits by producing output equal to 1/2 TB. With this move of producer Y, producer X will find his profits reduced. Therefore, X will reconsider his position. This process of adjustment and readjustment by each producer will continue, until the total output OM is produced and each is producing the same amount of output. In the final position, producer X produces OC amount of output and producer Y produces CM amount of output and OC = CM.

203

Cournot's duopoly solution can be extended to a situation with more than two sellers. If there were three producers, the total output would be 3/4 of OB, each producing 1/4 OB. If there are n producers, then under

Cournot's solutions, the total output produced will be $\dfrac{n}{(n+1)}$ of OB where OB is the maximum possible output. The essential conclusion is that; as the number of sellers increases from one to infinity the price is continually lowered from what it would be under monopoly conditions to what it would be under purely competitive conditions, and that for any number of sellers, it is perfectly determinate. The basic weakness of Cournot's duopoly model is that the the rivals assume the output of the other to be fixed, even though they observe constant changes in output.

2. Bertrand's model

Joseph Bertrand, a French mathematician criticised Cournot's duopoly solution and put forward a substitute model of oligopoly. In Bertrand's model, each producer assumes his rival's price to be constant. The products produced and sold by the two producers are completely identical. The two producers have identical costs. Moreover, the productive capacity of the producers is unlimited. Bertrand's model can be explained with an example. There are two producers A and B. If A goes into business first, he will set the price at the monopoly level, which is the most profitable for him. Suppose B also enters into the business and starts producing the same product as produced by A. B assumes that A will go on charging the same pricei Therefore, he can undercut the price changed by A to capture the whole market. He will set a price slightly lower than I A's price. A's sales fall to zero. Now A will reconsider his price policy. He assumes that, B will continue to charge the same price. There are two alternatives open to him. First, he may match the price cut made by B or he may charge the same price as B charges. In this case, he will secure half the market. Secondly, he may undercut B and set a slightly lower price than that of B. In this case A will seize the entire market. Evidently the latter course looks more profitable and thus A undercuts B and sets a price lower than B's price. Now

producer B will react and think of changing his price, He also has two alternatives: He may match A's price or undercut him. Since undercutting is more profitable, B will set a price a little lower than A and seize the whole market. But again A will be forced to undercut B. This price war will go on until price falls to the level of cost. When price is equal to cost, neither of them will like to cut the price further or raise the price and therefore, the equilibrium has been achieved. In Bcrtrand's model, equilibrium is achieved when market price is equal to the average cost of production and the combined equilibrium output of the two duopolies is equal to the competitive output.

3. Edgeworth model

F.Y. Edgeworth, a famous French economist, also attacked Cournot's duopoly solution. He criticised 'Cournot's assumption that each duopolist believes that his rival will continue to produce the same output irrespective of what he himself might produce. According to Edgeworth each duopolist believes that his rival will continue to charge the same price. With this assumption and taking the example of Cournot's "mineral wells", Edgeworth showed that no determinate equilibrium would be reached in duopoly. Further, it is also assumed that the products of the two duopolists are perfectly homogeneous. The cost conditions of the two duopolists need not be exactly same but must be similar. Edgeworth's model is given in figure 36.

Fig. 36.
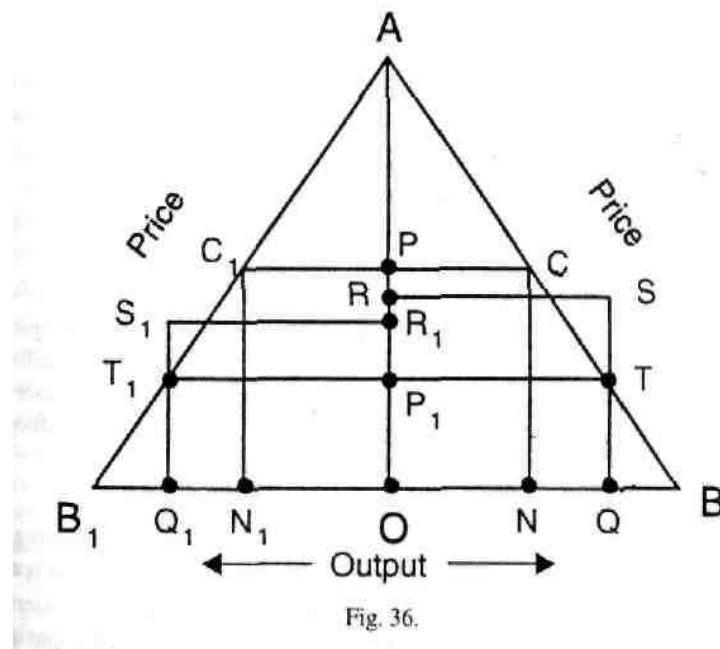
AB is the demand curve for producer X and AB_1 is the demand curve for producer Y. The maximum possible quantity each producer can produce and supply is OQ by X and OQ1 by Y. If each producer wants to sell his entire output, he will have to fix the price as OP_1 On the other hand, if the two rivals join together to maximise profit, they will fix the price at OP and sell ON and ON_1 output respectively. Each producer will get a maximum profit of ONCP and ON1 C1P respectively.

To start with, if the two producers charge the price OP then X and Y will be selling ON and ON_1 amounts of output respectively. Suppose producer X thinks of revising his price policy. Producer X will believe that producer Y will keep his price unchanged at OP. He realises that if he sets the price slightly lower than OP he can sell his entire output and get maximum profit. So producer X will lower his price from OP to OR and sells his entire output OQ and will earn profits equal to OQSR. This X would increase his profit by lowering his price.

But when producer X reduces his price, producer Y will find his sales considerably reduced. Profits will fall. As a result, producer Y will fix price at OR_1 so that he can sell his entire output. As a result of this, sales and profits of producer X will greatly decline. Producer X will now react and will think that if he reduces his price a little below OR_1 he will be able to sell his whole output by attracting customers of

producer Y. Thus when producer X reduces his price, his profits will increase for a moment. But producer Y will react and reduce his price further to increase his profits. In this way, price cutting will continue until the price falls to the level OP_1 at which both producers sell their entire output. At OP_1, producers X and Y are selling OB and OB_1 respectively and are making profits equal to $OBTP_1$ and $OB_1T_1P_1$ respectively. According to Edgeworth, equilibrium is not attained at OP1 price. Each will have incentive to raise the price. If producer X raises the price to OP, he will earn ONCP which are larger than profits at OP_1 price. Producer Y will also raise his price to the level slightly lower than OP. Producer X will now fix the price slightly lower than Y's level. In this way, price will fluctuate between OP and OP_1 gradually downwards but upwards in a jump. Thus Edgeworth's duopoly solution is one of perpetual disequilibrium and price will be constantly oscillating between the monopoly price and competitive price. No determinate and unique equilibrium of duopoly is suggested by Edgeworth's duopoly model.

4. Chamberlin's Duopoly Model

Edward Chamberlin has modified Cournot's model by assuming that the rivals understand the reality. His model is same as that of Cournot's.

AB is the market demand for mineral water. If producer X enters the market first, he will produce ON quantity at OP price and secure maximum monopoly profit of ONCP. At this stage producer Y enters the market and produces NQ amount and fixes OP' price and gets a profit of NQDE. Upto this point Chamberlin's analysis is the same as Cournot's. From this point
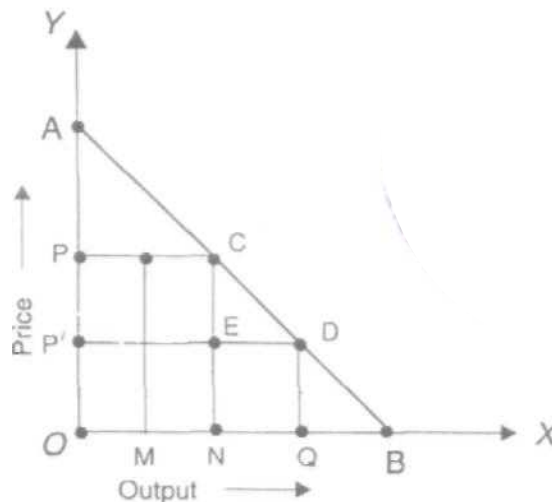
onwards, Chamberlin's analysis is different. Producer X immediately realises the mutual interdependence of the two producers and he reduces his output from ON to OM. Producer Y will produce the same amount NQ. Thus both produce the monopoly output of ON, fix the monopoly price OP and share equally the monopoly profit. (OMLP for X and MNCL for Y). Under this system there is stability but in Edgeworth's duopoly solution there is instability. Besides Chamberlin's model is a realistic description of the actual duopoly market situation.

5. Sweezy's Model

P. Sweezy introduced the kinked demand curve to explain the determination of equilibrium in' oligopolistic market. The demand curve facing an oligopolist has a kink at the prevailing price. This is because each oligopolist believes that if he lowers the price below the prevailing level increases his price above the prevailing level his competitors will not follow his increase in price. Due to this behavioural pattern of the oligopolists, the upper segment of the demand curve is relatively elastic and the lower portion is relatively inelastic.

If the oligopolist reduces its price below the prevailing price level MP, the competitors will fear that their customers would go away from them. Therefore, they will also reduce the price. Since all the competitors are reducing their price, the oligopolist will gain only very little sales. Hence the demand curve which lies below the prevailing price is inelastic. If the oligopolist raises his price above the prevailing price level his sales
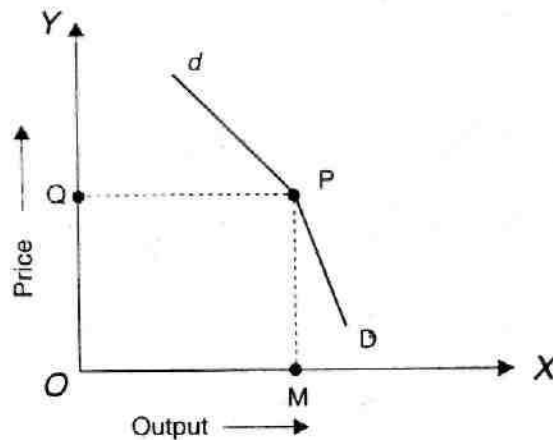
Fig. 38

will be reduced. As a result of a rise in price, his customers will go to his competitors. Thus an increase in price will lead to a large reduction in sales. This shows that the demand curve which lies above the current price level is elastic. Since the oligopolist will not gain a larger share of the market by reducing his price below the prevailing level and will loose a large share of the market by increasing his price he will not change the price.

For determining profit maximising price-output, combination, marginal revenue curve has to be drawn. The marginal revenue curve corresponding to the kinked demand
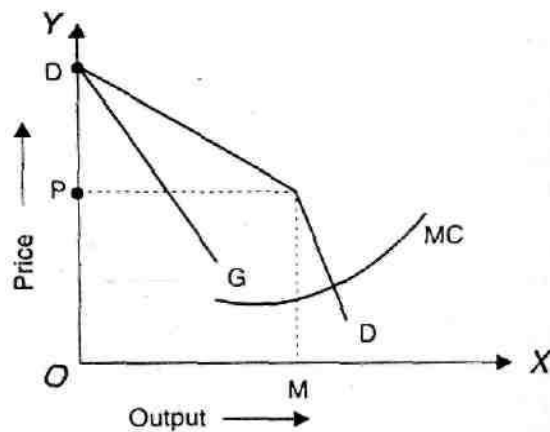
Fig. 39.

curve has a gap or discontinuity between G and H. This gap   ve occurs due to the kink in the demand curve and lies right below the kink. The length of the gap depends on the relative elasticities of the two portions of the demand curve. The greater the difference in the two elasticities the greater the length of the discontinuity. If the marginal

209

cost curve of the oligopolist passes through the discontinuous portion of the MR curve the oligopolist will be maximising his profit at the prevailing price level OP. As he is maximising profits at the prevailing price level he will have no incentive to change the price.

Even if cost conditions change the price will remain stable.
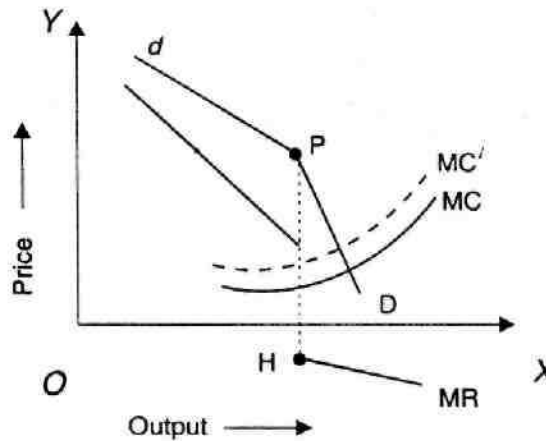
Fig. 40

When the marginal cost curve shifts upward from MC to MC^1 , the price remains unchanged as MC^1 passes through the gap GH.

Similarly, the price will remain stable even when the demand conditions change. When the demand for the oligopolist increases from D to D^1, the given marginal cost curve MC cuts the new marginal revenue curve MR within the gap. This means that the same price continues to prevail in the market.

The major drawback of the kinked demand curve is that it does not explain the determination of price. It explains only price rigidity. Further it is not applicable to price leadership and cartels. Kinked demand curve is also not applicable to oligopoly with product differentiation. Due to these deficiencies, a general theory of pricing is impossible under oligopoly.

19.6 LET US SUM UP

In this lesson we have studied the character of duopoly market situation and also an extensive discussion is made on oligopolistic competition. Types of oligopoly are also discussed. Various models contributed by different economists are also illustrated in this lesson.

19.7 LESSON – END ACTIVITIES

1. What do you mean by 'DUOPOLY'

2. Discuss about price rigidity under oligopoly

3. Explain different types of oligopoly

4. Illustrate the various models of oligopoly competition.

19.8 REFERENCES

1. Peterson, Craig, H. and Lewis Cris, W. "Mangaerial Economic, Pearson, Education Asia.

2. Mehta, P.L., "Managerial Economics, Sultan Chand & Sons.

3. Maurise, Charles, S. Thomas and Others "Mangerial Economics applied Micro Economics for Decision Making, Irwin.

4. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics.

5. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

6. Sankaran, "Buseinss Economics.

7. McGuigan, Moyer and Harris: Managerial Economics, West Publishing Company

Lesson:20 -PRICE LEADERSHIP

CONTENTS

2.0 AIMS AND OBJECTIVES

After having studied this unit you should be able to

- To understand the methodology of Price Leadership
- To know the various types of Price Leadership
- To analyse the merits and problems

20.1 INTRODUCTION

In this lesson one of the characters of oligopolistic situation 'Price Leadership' is discussed. It is an alternative method used to avoid tough competition. A firm that could dominate the market tries to possess this Price leadership feature.

20.2 PRICE LEADERSHIP

Price leadership is a feature of oligopolistic situation. One firm assumes the role of a leader and fixes the price of a product or the entire industry. Price leadership can be seen when most or all of the firms in an industry decide to sell their product at a price fixed by one among them. The other firms in the industry follow this price. These price

followers simply accept the price fixed by the price leader and adjust their output to this price. The price leader may be the biggest firm in the industry or it may be a firm with the lowest cost of production. Its leadership may be established as a result of price-war in which it emerges as the winner. Independent pricing by each firm in the industry is rarely seen in the oligopolistic situation. Instead there will be some agreement among the various firms with regard to the price that is to be charged. The agreement among these rival firms may be formal or informal. There may be a formal agreement among the various firms to follow the price fixed by a leader chosen from among them. Or there may be only an informal understanding among themselves.
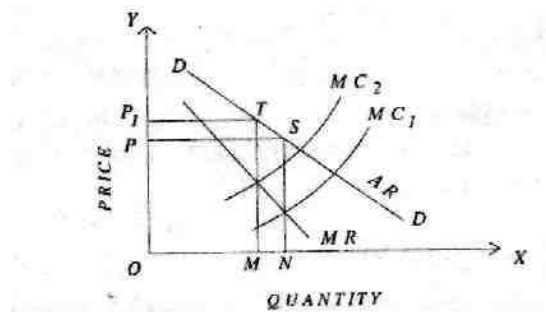
The price and output decisions are illustrated in the above figure. Here it is assumed that there are only two firms A and B and firm A has a lower cost of production than B. These two firms are producing homogeneous products and are having equal share in the market. Thus these firms face the same demand curve which will be half of the total market demand curve. DD is the demand curve facing each firm which is half of the total demand curve for the product. MR is the marginal revenue curve of each firm. MC, is the marginal cost curve of firm A and MC2 is the marginal cost curve of the firm B. As the firm A has a lower cost of production than the firm B, MC, is drawn below MC2. If the price is fixed independently each firm will fix a price at which MC=MR. Then price of A would have been OP and B would have been OP,. But in the oligopolistic market the firm B cannot make maximum profit by fixing the price as OP, The firm B is to fix its price as OP, the price the low cost firm A has fixed. Firm B can sell its product

213

only if it accepts its price as OP, the lower price. While A makes maximum profit, B is to be satisfied with a lower profit. Thus firm A is price leader and firm B has to follow it.

20.3 TYPES OF PRICE LEADERSHIP

The following are the important types of price leadership.

1. Price Leadership of the Dominant Firm

One firm controls a major portion of the total market supply and hence dominates the entire market. The supply of other firms in the market is individually insignificant. The dominant firm fixes the price and the other firms simply accept this price. The other firms in the industry fix their output to the price fixed by the leading firm. The leader fixes a price that will give it maximum profit.

2. Barometric Price Leadership

In the barometric price leadership an old experienced firm, not necessarily dominant one, assumes the role of a leader and fixes a price acceptable to all the firms in the industry. In order to fix the price this experienced firm takes into consideration the demand for the product, cost of production, competition from the rival producers etc. The leader, while fixing the price, does not look after its own interest rather it considers the interest of all the firms in the industry. As the leader protects the interests of all the firms in the industry, all the firms happily follow the price leader.

3. Aggressive Price Leadership

When the dominant firm wants to eliminate its rivals in the market it may turn to aggressive price leadership. For this it may use both legal and illegal methods. The other firms unwillingly accept the leader and the price fixed by it.

20.4 FEATURES OF A PRICE LEADERSHIP FIRM

(i) The firm has a considerable share in the total market supply.

(ii) The firm is reputed one for fixing a suitable price.

(iii) The firm has initiative in taking timely action after considering the various factors.

(iv) The firm has a relative cost advantage which gives it a supremacy among the various firms in the industry.

20.5 MERITS and PROBLEMS of PRICE LEADERSHIP

MERITS

(i)   Price war leading to unhealthy competition among the various firms can be avoided.

(ii)   This ensures the survival of both large and small firms.

(iii)   Helps to reduce uncertainty in the oligopoly market situation.

(iv)   The price fixed by the leader, considering the possibilities of entry of new firms, helps to restrict the entry of new firms.

(v)   It helps to avoid government interference or any public criticism.

(vi)   Frequent price changes, especially those of a retaliatory nature, can be avoided.

PROBLEMS

(i)   If the leader is not able to make a correct estimation of the reactions of his followers he may lose his leadership.

(ii)   The rival follower may charge lower prices. This price cutting may be in the form of discounts and rebates, credit facilities, after-sales services, 'money back' guarantee, easy installment facilities etc. The price leader who charges high price now loses part of his market.

(iii)   Even when the rival firms follow the price fixed by the leader they may indulge in 'non-price competition' to increase their sales. This avoids a direct confrontation with the leader but helps to reduce the share of the leader in the market. This non-price competition may be possible with the concessions mentioned above. Advertising and other sales promotion methods like product quality improvement etc. help this.

(d)   As the high price results in super profitability it may attract new entrants into to the industry who may not accept the leader.

20.6 LET US SUM UP

In this lesson we have studied the concept of price leadership which a firm could assume for avoiding competition in the market situations. We came to know that 'Price Leadership' is a feature of oligopolistic situation. We have also studied the types of price leadership. We have also listed the merits and problems due to the firm on the assumption of price leadership.

20.7 LESSON-END ACTIVITIES

1. Explain the concept of Price Leadership in detail
2. Discuss the different types of Price leadership
3. on the assumption of price leadership what are the advantages and difficulties which a firm would face.

20.8 REFERENCES

1. Peterson, Craig, H. and Lewis Cris, W. "Mangaerial Economic, Pearson, Education Asia.

2. Mehta, P.L., "Managerial Economics, Sultan Chand & Sons.

3. Maurise, Charles, S. Thomas and Others "Mangerial Economics applied Micro Economics for Decision Making, Irwin.

4. Reddy P.N. and Appanniah, H.R. "Principles of Business Economics.

5. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

6. Sankaran, "Buseinss Economics.

7. McGuigan, Moyer and Harris: Managerial Economics, West Publishing Company

Lesson: 21 - PRICING POLICY

CONTENTS

21.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To Know in detail the concept of pricing

- To understand different methods and kinds of pricing

- To identify the factors affecting pricing policy

- To apply pricing decision at the time of introducing new products

21.1 INTRODUCTION

Pricing assumes a significant role in a competitive economy. Price is the main factor which affects the sales of a organisation. A good price policy is of great importance to the producers, wholesalers, retailers and the consumers. Marketers try to achieve their long-run pricing objectives through both price policies and price strategies. If the prices are high, few buyers purchase and if the prices are low, many buyers purchase. Thus market may be reduced or increased. That is, the price increases in relation to the sales revenue. Thus pricing is a critical situation. Therefore, a sound pricing policy must be adopted to have maximum sales revenue.

218

In the early stages of men, prices were set by buyers and sellers negotiating with each other. The seller may demand a higher price than expected and the buyer may offer a price less than the expected one. Ultimately they arrive at an agreeable price through bargaining. Now in the competitive economy, development of large business aims to have one price policy. In certain cases, the buyer looks at the price as an indicator of product quality. If the price is higher, the buyer believes the products to be of high quality. In case the quality is not up to the mark he expects, he feels that the price is high. Hence, one cannot say that the price is high or low, without considering the quality of the product to be purchased. The price is greatly affected or influenced for future production and marketing.

Prices play an important role in the economy. The time within which the product is sold varies. The goods, which are of a perishable nature and frequent changes of style, may not be stocked for long time. In the case of durable goods, they can be stocked for longer time, in the hope of getting favorable price rise. Holding the stock depends upon the financial resources of farmer, middleman, wholesaler etc., and the perish ability of the goods.

Price

Price may be defined as the exchange of goods or services in terms of money. Without price there is no marketing in the society. If money is not there, exchange of goods can be undertaken, but without price; i.e., there is no exchange value of a product or service agreed upon in a market transaction, is the key factor which affects the sales operations.

What you pay is the price for what you get.

Price is the exchange value of goods or services in terms of money.

Price of a product or service is what the seller feels it worth, in terms of money, to the buyer.

21.2 IMPORTANCE OF PRICE POLICY

A well formed price policy has special importance if price rise is a continuous process in planned economy. It has not only the influenced the living standard of people

219

but due to increase in the expenditure of full planning, the prescribed aims and objectives of the planning are shattered. As a result, there is obstruction of economic development. But in underdeveloped countries, with economic development, price rise is quite natural. Till the increase in monetary income of the public is more than price rise, there is no comprehension. But when there is more price rise than investment and national income, there is a need to protect from the defects of monetary fluctuations. It requires price regulation. In short, in developing countries, the significance of price policy can be known from the following facts:

1. To Maintain Appropriate Living Standard. Price rise lets living standard of people fall and economic development of the country is obstructed. To maintain the proper living standard, price control is essential.

2. To Maintain Planning. As price rises, the work of planning increases which results in obstruction in the prescribed aims and objectives of the planning. To maintain the planning process in a fine manner, prices should be controlled at all costs.

3. Protection from Monetary Fluctuations. When price increase is more than investment and national income increases, monetary fluctuation defects are created. To remove them appropriate price control is required.

4.   Establishment of Balance in Demand and Supply. In a developing economy, due to changing circumstances, balance of demand and supply disrupts by which consumer, producer and investor have to take hardships. This shows that there is need to balance the demand

and supply in a proper way.

5.For Well Adjusted Distribution Management. With the view point of consumers for quick supply of goods on less prices distribution management should be well adjusted. For this, it is necessary to control the consumer price.

6.Multifaced Development of National Resources. The major objective of economic planning is multifaced development of national resources. Thus, price policy should be quite independent as price regulation can adjust this motto.

21.3 PRICING OBJECTIVES

To perform the marketing job efficiently, the management has to set goals first pricing is no exception. Before determining the price itself, the management must decide the objectives of pricing. These objectives are logically related to the company's overall goal or objectives The main goals in pricing may be classified as follows.

1. Pricing for Target Return (on investment) (ROI): Business needs capital, investment in the shape of various types of assets and working capital. When a businessman invests capital in a business, he calculates the probable return on his investment. A certain rate of return on investment is aimed. Then, the price is fixed accordingly. The price-includes the predetermined average return. This is seller-oriented policy. Many well-established firms adopt the objective of pricing in terms of "return on investment." Firms want to secure a certain percentage of return on their investment or on sales. The target of a firm is fixed in terms of investment For instance a company may set a target at 10 or 15% return on investment. Further this target may be for a long term or short term. Wholesalers and retailers may follow the short term, usually a year they charge certain percentage over and above the price, they purchased, which is enough to meet operational costs and a desired profit. This target chosen, can revised from time to time. This objective of pricing is also known as pricing for profit. Certain firms adopt this method as a satisfactory objective, in the sense they are satisfied with a certain rate of return.

2. Market Share: The target share of the market and the expected volume of sales are the most important consideration in pricing the products. Some companies adopt the main pricing objective so as to maintain or to improve the market share towards the product. A good market share is a better indication of progress. For this, the firm may lower the price, in comparison to the rival products with a view to capture the market. By reducing the price, customers are not exploited rather benefited. The management can compare the present market share with the past market share and can know well whether the market share is increasing or decreasing When the market shares decreasing, low pricing policy can be adopted by large scale manufacturers who produce goods needed daily by the consumers. So margin of profit comes down because of low price, but the competitors

are discouraged from entering the market. By low pricing policy, no doubt, market share can be increased, besides attracting new users.

3. To Meet or Prevent Competition: The pricing objective may be to meet or prevent competition. While fixing the price, the price of similar products, produced by other firms, will have to be considered. Generally, producers are not in a haste to fix a price at which the goods can be sold out one has to look to the prices of rival products and the existing competition and chalk out proper price policy so as to enable to face the market competition. At the time of introduction of products to the market, a low price policy is likely to attract customers, and can establish a good market share. The low price policy discourages the competitors.

4. Profit Maximisation: Business of all kinds is run with an idea of earning profit at the maximum. Profit maximisation can be enjoyed where monopolistic situation exists. The goal should be to maximise profits on total output, rather than on every item- The scarcity conditions offer chances for profit maximisation by high pricing policy. The profit maximisation will develop an unhealthy image. When a short-run policy is adopted for maximising the profit, it will exploit the customers. The customers have a feeling of monopoly and high price. But along run policy to maximis the profit has no drawbacks. A short-run policy will attract competitors, who produce similar goods at low cost. As a result, price control and government regulations will be introduced.

5. **Stabilize Price**: It is a long-time objective and aims at preventing frequent and violent fluctuations in price. It also prevents price war amongst the competitors. When the price often changes, there arises no confidence on the product. The prices are designed in such away that during the period of depression, the prices are not allowed to fall below a certain level and in the boom period, the prices are not allowed to rise beyond a certain level. The goal is to give and let live. Thus firms forego maximum profits during periods of short supply of products.

6. **Customer Ability to Pay:** The prices that are charged differ from person to person, according to his capacity to pay. For instance, doctors charge fees for their services awarding to the capacity of the patient.

7. **Resource Mobilization:** This is a pricing objective, the products are priced it such a

222

way that sufficient sources are made available for the firms' expansion, developmental investment etc. Marketers are interested in getting back the amount invested as speedily as possible. The management may fix a higher price and this trend will invite competitors with low priced similar products.

8. Survival and growth: An important objective of pricing is survival and achieving the expected rate of growth. Profits are less important than survival. According to P. Drucker, avoidance of loss and ensuring survival are more important than maximisation of profit.

9. Prestige and goodwill: Pricing also aims at maintaining the prestige and enhancing the goodwill of the firm.

21.4 FACTORS AFFECTING PRICING POLICY

Price policy is government by external factors and internal factors. External factors are-elasticity of demand and supply competition goodwill of firm, trend of the market, and management policy.

Keeping in view above facts, certain general considerations which must be kept in view while formulating a suitable price policy are listed below:

(A) Internal Factors

(1) Organisational Factors

Pricing decisions occur on two levels in the organisation. Over-all price strategy is dealt with by top executives. They determine the basic ranges that the product falls into in terms of market segments. The actual mechanics of pricing are dealt with at lower levels in the firm and focus on individual product strategies. Usually, some combination of production and marketing specialists are involved in choosing the price.

(2) Marketing Mix

Marketing experts view price as only one of the many important elements of the marketing mix. A shift in any one of the elements has an immediate effect on the other three-Production, Promotion and Distribution. In some industries, a firm may use price reduction as a marketing technique. Other firms may raise prices as a deliberate strategy to build a high-prestige product line. In either case, the effort will not succeed unless the price change is combined with a total marketing strategy that supports it. A firm that

223

raises its prices may add a more impressive-looking package and may begin a new advertising campaign.

(3) Product Differentiation

The price of the product also depends upon the characteristics of the product. In order to attract the customers, different characteristics are added to the product, such as quality, size, colour, attractive package, alternative uses etc. Generally, customers pay more price for the product which is of the new style, fashion, better package etc.

(4) Cost of the Product

Cost and price of a product are closely related. The most important factor is the cost of production. In deciding to market a product, a firm may try to decide what prices are realistic, considering current demand and competition in the market. The product ultimately goes to the public and their capacity to pay will fix the cost; otherwise product would be flapped in the market.

(5) Objectives of the Firm

A firm may have various objectives and pricing contributes its share in achieving such goals. Firms may pursue a variety of value-oriented objectives, such as maximising sales revenue, maximising market share, maximising customer volume, minimising customer volume, maintaining an image, maintaining stable price etc. Pricing policy should be established only after proper considerations of the objectives of the firm.

(B) External Factors

3. External Factors

External factors are those factors which are beyond the control of an organisation. The following external factors would effect the pricing decisions :

1. Demand: The nature and condition of demand should be considered when fixing the price. Composition of the market, the nature of buyers, their psychology, their purchasing power, standard of living, taste, preferences and customs have large influence on the demand. Therefore the management has to weigh these factors thoroughly. If the demand for a product is inelastic, it is better to fix a higher price for it. On the other hand, if demand is elastic, lower price may be fixed.

2. Competition: In modern marketing, a manufacturer cannot fix his own price without

224

considering the competition. A number of substitutes enter the market these days. Hence the influence of substitutes has also to be considered when fixing a price. A firm must be vigilant about the prices charged by competitors for the similar products. If prices are fixed higher than the prices charged by competitors, the customers are likely to switch over to the products of competitors. On the other hand, if the prices charged are much lower than the prices of the rivals, the customers may become suspicious about the quality and hence lower price may not lead to higher sales. To avoid competitive pricing, a firm may resort to product differentiation. Sometimes a higher price may itself differentiate the product. In view of these, the management must be very careful in determining the prices.

3. Distribution channels: Distribution channels also sometimes affect the price. The consumer knows only the retail price. But there is a middleman working in the channel of distribution. He charges his profit. Thus when the articles reach the hands of consumers, the price becomes higher. It sometimes happens that the consumers reject it.

4. General Economic conditions: Price is affected by the general economic conditions such as inflation, deflation, trade cycle etc. In the inflationary period the management is forced to fix higher price. In recession period, the prices are reduced to maintain the level of turnover. In boom period, prices are increased to cover the increasing cost of production and distribution.

5. Govt. Policy: Pricing also depends on price control by the Govt, through enactment of legislation. While fixing the price, a firm has to take into consideration the taxation and trade policies of govt.

6. Reactions of consumers: An important factor affecting pricing decisions is the attitude of consumers. If a firm fixes the price of its product unreasonably high, the consumers may boycott the product.

21.5 METHODS OF PRICING

There are four basic pricing policies. They are:

1. Cost-based pricing policies.

2. Demand - based pricing policies.

3. Competition - based pricing policies.

225

4. Value-based pricing policies.

Cost-based pricing policy

The policy of setting price essentially on the basis of the total cost per unit is known as cost-oriented pricing policy. In about 68% of consumer goods companies and about 89% of_industrial products manufacturing companies take their pricing decision based on cost of production. The following are the four methods of pricing which fall under cost-oriented pricing policy.

1. Cost plus Pricing: The theory of full cost pricing has been developed by Hall and Mitch. According to them, business firms under the conditions of oligopoly and monopolistic competitive markets do not determine price and output with the help of the principle of MC = MR. They determine price on the basis of full average cost of production AVC + AFC margin of normal profit.

This is the most common method used for pricing. Under the method, the price is fixed to cover all costs and a predetermined percentage of profit. In other words, the price is computed by adding a certain percentage to the cost of the product per unit. Under this method, cost includes production cost (both variable and fixed) and administrative and selling and distribution cost (both variable and fixed). This method is also known as margin pricing or average cost pricing or full cost pricing or mark-up pricing. This method is very popular in wholesale trade and retail trade.

Advantages of Cost plus Pricing

(l) This method is appropriate when it is difficult to forecast the future demand.

(2) This method guarantees recovery of cost. Hence it is the safest method.

(3) It helps to set the price easily.

(4) Both single product and multi product firms can apply this method for pricing.

(5) It ensures stability in pricing.

(6) If this method is adopted by all firms within the industry, the problem of price war can be avoided.

(7) It is economical for decision making.

Disadvantages Of Cost Plus Pricing

(l)This method ignores the effect of demand.

(2) It does not consider the forces of market and competition.

(3)This method uses average costs, ignoring marginal or incremental costs.

(4) This method gives too much importance for the precision of allocation of costs.

2. Target Pricing: This is a variant of full cost pricing. Under this method, the cost is added with a predetermined target rate of return on capital invested. In this case, the company estimates future rates, future cost and calculates a targeted rate of return on investment after tax. This method is also known as rate of return pricing.

Advantages of Target or Rate of Return Pricing

(1) This method guarantees a certain rate of return on investment.

(2)This method can be used for pricing new products.

(3)Prevention is better than cure' principle is applied in this method.

(4) This is a long term price policy.

Disadvantages of Target Pricing

    (1) His method is not practical when there is a tough competition in a market.

    (2) This method ignores the demand of the product.

    (3) It is difficult to predetermine the cost of products.

3. Marginal Cost Pricing: Under both full cost pricing and rate of return pricing, the prices are set on the basis of total cost (variable cost + fixed cost). Under the marginal cost pricing, the price is determined on the basis of marginal or variable cost. In this method, fixed costs are totally excluded.

Advantages of Marginal Cost pricing

    (1) This method is very useful in a competitive market.

    (2) This method helps in optimum allocation of resources. It is particularly useful when the products have low demand.

    (3) This method is suitable to pricing over the life cycle of the product.

    (4) It is the most suitable .method of short run pricing.

    (5) The method is useful at the time of introducing a new product.

Disadvantages of Marginal cost pricing

    (1) Firms may not be able to cover up costs and earn a fair return on capital employed.

227

(2) It requires a better understanding of marginal costing technique.

(3) When costs are decreasing this method is not suitable because it will result losses.

(4) This method is not suitable for long run.

4. Break even pricing: this is a form of target return pricing. In fact, it is a refinement to cost-oriented pricing. Under break even pricing, break even analysis is used for point.

Even pricing, break even analysis is used for pricing. The firm first determines the break even point. It is the point at which the total sales are equal to total cost no profit no loss point at which the total sales are equal to the average total cost of product. Thus, both variable cost and fixed cost are covered under this methods but it does not include any profit.

Importance of break even pricing:

This method of pricing helps in understanding the relationship between revenue and cost of the company in relation to its volume of sales. it helps in determining that volume at which the company's cost and revenue are equal.

This method of pricing is very important in profit planning. It shows the effects on profit of changing the amount invested in advertisement of changing the sales compensation methods of adding a new product or of changing a marketing in focusing channel this methods of pricing helps the marketer in a calculating output or sales to earn a desired profit calculating margin of safety changes in price making decisions, and changes in cost and price et.

2. Demand - based Pricing Policy

Under this pricing policy, demand is the basic factor. Price is fixed simply adjusting it to the market conditions. In short, the price is fixed according to the demand for a product. Where the demand is heavy, a higher price is charged. When the demand is low, a low price is charged. The following are the methods of pricing which fall under this policy:

1 **Differential pricing:** Under this method the same product is sold at different prices to different customers, in different places and at different periods.   For instance, a cinema house charges different rates for different categories of seats. Telephone authorities

228

charge less for trunk calls at night than during day. This method is also called discriminatory pricing or price discrimination.

2. **Modified Break-even analysis:** This is a combination of cost based and demand based pricing techniques. This method reveals price-quantity mix that maximizes total profit. In other words, under this method, prices are fixed to achieve highest profit over the BEP in consideration of the amount demanded at alternative prices.

3. Premium Pricing: It is a phenomenon of the 1990s. It is based on the principle that the product or brand should be positioned at the top of the market and must offer greater

v   a   l   u   e   i   n

qualitative terms than similar brands in other price segments. In short, it is called high pricing. The BPL, group followed this when they invaded the refrigerator market with a Rs. 37,000 brand (a four - door, 350 liter, frost - free refrigerator). The other companies which follow premium pricing include Titan, Sony TV, Arial and Dove Conditioner.

4. Neutral Pricing: It means offering extra value or benefits with the brand cost or price remaining competitive. Cadbury is offering 30 percent more chocolate in its 5 Star bar at same price.

3. Competition-based Pricing Policy: It is the policy of fixing the prices mainly on the basis of prices fixed by competitors. This policy does not necessarily mean setting of same price. With a competition oriented pricing policy, the firm may keep its price higher or lower than that of competitors. Actually this policy implies that the firms 'pricing decisions is not based on cost or demand, prices are changed or maintained in line with the competitor's prices. The following methods fall under this policy.

1. **Going rate pricing:** Under this method, prices are maintained at par with the average level of prices in the industry. The firm adjusts its own prices to suit the general price structure in the industry. In other words, it is the method of charging prices according to what competitors are charging. This method is usually adopted by firms selling a homogeneous product in a highly competitive market. Under this method a firm accepts the price prevailing in the industry to avoid a price war. This method is also called acceptance pricing or market equated pricing or parity pricing. LML Vespa was following this method

229

for a number of years with market leader Bajaj. This method is particularly useful where cost ascertainment is difficult. This technique is adopted in the situation of price leadership.

Advantages of going rate pricing

1. It helps in avoiding cut-throat competition among the firm.

2. This method is found more suitable when costs are difficult to measure.

3. This method is less expensive because calculation of cost and demand is not necessary.

4. It is suitable to avoid price war in oligopoly.

5. This can be used for pricing new products.

Disadvantages of going rate pricing

1. This method is not suitable for long run pricing.

2. Cost of the product and other marketing factors are not considered at all under this policy.

2. **Customary pricing**: In case of some commodities the prices get fixed because they have prevailed over a long period of time. For example, the price of a cup of tea or coffee is customarily fixed. In short, these prices are fixed by custom. The price will change only when the cost changes significantly. Before changing the customary prices, it is essential to study the prices of competitors. Customer prices may be maintained even when products are changed. For example, the new model of a radio may be parked at the same level as the discontinued model. Thus, under this method, the existing price is maintained as long as possible.

3. **Sealed bid pricing**: In all business lines when the firms bid far jobs, competition based pricing is followed. Costs and demand are not considered at all. The firm fixes its prices on how the competitors price their products. It means that if the firm is to win a contract or job, it should quote less than the competitors.

4. Value based Pricing

Under this policy the price is based on value to the customer. The following are the pricing methods based on customer value.

1. **Perceived - value pricing:** Another method is judging demand on the basis of value perceived by the consumers in the product. Thus perceived value pricing is concerned with setting the price on the basis of value perceived by he buyer of the product rather than the seller's cost. When a company develops a news product. it anticipates a particular position

230

for it in the market in respect of price, quality and service, 'Then it estimates the quality it can sell at this price. The company then judges whether at this level of production and sale, it will have a satisfactory return investment. If it appears to be so, the company goes ahead with translating the perception into practice, otherwise it drops the proposal.

Jerome Rowitch, owner of the Sculpture Gardens Restart in Venice. California invited a selected group of affluent residents to dine at his restaurant and told them pay what they felt their meals were worth. Did it work?. The 100 plus diners who Rowitch up on the deal paid in average Rs.50, about *30%* higher than *the* prices he would have normally charged. A firm can try this pricing approach of Jerome Rowitch.

3.**Value for money pricing:** This is now seen as more than a pricing method. Under this method price is based on the value which the consumers get from the product they buy. It is used as a complete marketing strategy. Videocon did it when they launched their 63 cm flat screen Bazooka when BPL's HR and Onida's KY Series models are dominating the flat sit-in TV segment. Bazooka perceived value was Rs. 25,000. But driven by value for money strategy, Videocon priced Bazooka at Rs.21, 000 only.

21.6 PRICING OF NEW PRODUCTS

The introduction of a new product will pose a challenging problem for any firm. In the case of new products there is no past information for ascertaining trends and consumer reaction. If the new product is with high distinctiveness among the existing products, then price should be fixed on the basis of such factors as demand, market - target and the promotional strategy. In the case of pioneer product, the estimation of its demand is very difficult. The estimate of demand for such products should be made on the basis of the following factors:

1. **Product acceptability:** The manufacturer should ascertain whether the new product will be accepted by the consumers or whether the consumers are willing to buy the product. The willingness to buy depends upon a factor like whether it would meet their requirements.

2. **Range of prices:** It is very essential to assess the reactions of the consumers at different prices. For this, a market research will have to be undertaken. The core question that arises is at what prices different quantities of the product are demanded.

231

3. **Expected volume of sales:** The next task is to determine the anticipated volume of sales at different prices. This depends upon demand elasticity and cross elasticity.

4. **Reaction to price:** The assessment of the reaction of the consumers to the price is a very tricky task. The company which introduces a new product will have to monitor the activates of the rivals in order to find out the marketing strategies that they are going to adopt.

In short, the price of a new product should be fixed after taking into account the potential demand, objectives, degree of competition and strategy of competitors etc.

Methods or Strategies of Pricing of New Products.

In pricing a new product, generally two type are followed -

(a) Price Skimming

When a new product is introduced in the market, the firm fixes a price much higher than the cost of production. The consumers are ready to pay a high price to enjoy the pleasure of being the first users of the product. The high price charged helps to skim the cream off the market at a time when there is no competition this is possible because the newly introduced product reached the hands of the consumers after a long waiting and by the time it comes to the market a heavy demand for the same has accumulated. When fixing the price the producer takes this advantage of the market. This market situation will not continue for long. In the long run new firms will enter into the industry. In the long run the number of enthusiastic buyers who are ready to buy at a high price will decrease. For example, when electronic goods like TV, tape recorders, calculators, VCR etc, were introduced their prices were very high. But gradually when more and more new producers imitated these products their price came down.

The firm makes a huge profit by price skimming. The price skimming policy is followed as long as there is heavy demand without any competition from a rival. The principle behind price skimming is to make hay while sun shines. In the long run the possibility of making huge profit by price skimming disappears. The price, in fact, gets normalized around the cost of production.

Under the following situations the price skimming policy can be easily followed.

232

(i)   The new product is a novel item which can attract customers and is having no competitors at present.

(ii) The product is meant for the higher income group whose demand is inelastic. The firm can charge a high price which will help them to realise a good share of the heavy initial investment in the form of research and development expense.

(iii)   There are heavy initial promotion expenses and the firm wants to realise it from the customers before other competitive firms-enter in. The firm, after squeezing the enthusiastic buyers, goes on reducing the price step-by-step so that it can reach the various sections of consumers who are willing to buy it at lower prices.

(b) Penetration Pricing

The price fixed is relatively a lower one. This pricing is resorted to when the new product faces a strong competition from the existing substitute product. When the new firm enters an existing market where there are a number of firms it has to penetrate the market and achieve an acceptance for its product. In order o attain this it will charge only a very low price initially, hoping to charge a normal price later when it is established in the market. For example, a firm may, when it introduce a new bath soap in the market give a 100 gms Piece free when consumers buy two 200 pieces at a time. Later when it picks up sales it takes out the initial discount. In a foreign market a new country may have to penetrate through a highly competitive price.

The penetration price may be sometimes below the cost of production. This can be justified in the following cases.

(a) The lead time in production is short.

(b) Increased production will result in reduced cost of production.

(c) The product is meant for mass consumption.

(d) The product is one where brand loyalty counts.

(e) The product cannot be protected by patent right.

(f) The fear of competition.

21.7 KINDS OF PRICING

By following the above principles, business firms nay opt various kinds of pricing for products. A few, important of them are explained below.

1   Psychological Pricing: Many consumers use the price as an indicator of quality. Costs and other factors are important in pricing. Yet, psychology of the price is also considered certain people prefer high priced products, considered to be of high quality. Costly items diamond, jewellery etc., reveal the status of the person who wears them. They demand highly priced items. For example, highly priced television sets carrying prestige prices are in demand. Then in the retail shops another pricing 'odd pricing' issued. The paces are set at odd amounts, such as Rs. 19.95 instead of Rs. 20; Rs. 299.90 instead of Rs. 300 Odd prices, by psychology brings more sales. An article priced at Rs. 9.90 will have more sales than when it is priced Rs.10.

2. Customary Pricing: Customers expect a particular price to be charged for *certain* products. The prices are fixed to suit local conditions. The customers are familiar with the market condition. Manufacturers cannot control the price. Such products are typically a standardized one. Certain business people reduce the size of the product, if the cost of manufacturing increases, Sometimes, the firm changes the price by adopting new package, size etc. For example confectionary items.

3. Skimming Pricing: It involves a high introductory price in the initial stage to skim the cream of demand. The products, when introduced in the market have a limited period free from other manufacturers. During this period, it aims at profit Maximisation, according to the favorable market condition. Generally, the price moves downwards are when competitors enter into the market field.

4. Penetration Pricing: A low price is designed in the initial stage with a view to capture market share. That is if the pricing policy is to capture greater market share, then this is done only by adoption of low prices in the initial stage. Because of the low price, sales value increases, competition falls down.

5.   Geographical Pricing: The distance between the seller and the buyer is consided geographic   pricing. In India, the cost of transportation is an important pricing factor because of vide geographical distance between the production centre and consuming centre. The majority producing centers are located in Bombay, Delhi, Calcutta and Madras and at the same time consuming centers are dispersed throughout India. There are three ways of charging transit.

234

(a) **F.O.B. Pricing:** In FOB (original) pricing, the buyer will have to incur the cost of traansit and in FOB (destination) the price influences the cost of transit charges.

(b) **Zone Pricing**: Under this, the company divides the market into zones and quotes uniform prices to all buyers who buy within a zone. The prices are not uniform all over India. The price in one zone varies from that of another one. The prices are uniform within a zone. The price is quoted by adding the transport cost.

(c) **Base Point Pricing**: Base point policy is characterized by partial absorption of transport cost by the company. One or more cities are selected as points from which all shipping charges are calculated

6. **Administered Price**: Administered price is defined as the price resulting from managerial decision and not on the basis of cost, competition, demand etc. But this price is set by the management after considering all relevant factors. There are many similar products manifesting different firms and m ore or less the price tends to be uniform. Usually the administered price remains unaltered for a considerable period of time.

7. **Dual Pricing:** under this dual pricing system, a producer is required compulsorily to sell a part of his production to the government or its authorized agency at a substantially low price. The rest of the product may be sold in the open market at a price fixed by the producer.

8. **Mark up Pricing:** This method is also known as cost plus pricing. This method is generally adopted by wholesalers and retailers. When they set up the price initially, a certain percentage is added to the cost before marking the price. For example, the cost of an item Rs.10and is sold at Rs.13 the Mark up is Rs. 3 or 30%.

9. **Price Lining**: This method of pricing is generally followed by the retailers than wholesalers this system consists of selecting a limited number of prices at which the store will sell its merchandise. Pricing decisions are made initially and remain constant for a long period. The firm should decide the number of lines and the level of each price line. Many prices are not desired and the prices should not be too close to each other or too far from each other. For example shoe firm have several types of shoes, priced at Rs. 120, 140, 170 etc., a pair.

10. **Negotiated Pricing**: It is also known as variable pricing. The price is not fixed. the

235

price is fixed upon bargaining. In certain cases, the product may be prepared on the basis of specification or design by the buyer. In such cases, the price has to be negotiated and then fixed.

11. **Competitive Bidding**: Big firms or the government calls for competitive bids when they went to purchase certain products or specialized items. The probable expenditure is worked out then the after offer is made quoting the price, which is also known as contract price. The lowest bidder gets the work.

12. **Monopoly Pricing:** Monopolistic conditions exist where a product is sold exclusively by one producer or a seller. When a new product moves to the market, its price is monopoly price there no problem is no competition or no substitute. Monopoly price will maximize the profits, as there is no pricing problem.

21.8 LET US SUM UP

In this lesson the importance of pricing in the competitive economy is identified. We have identified the factors that could affect the pricing policy in a broad manner.

We have also studied about the various methods of pricing and analysed its advantages and disadvantages. We have discussed the strategies to be adopted while pricing new products. We have briefly discussed the kinds of pricing which a business firm would adopt by keeping few principles in mind.

21.9 LESSON – END ACTIVITIES

1. Define the term 'Price'

2. Critically examine price as a weapon of competition

3. Discuss the alternative policies of pricing available to a firm

4. Examine the internal and external factors that could affect the pricing policy

5. Explain the types of pricing that are followed while pricing a new product

6. Describe the various kinds of pricing

21.10 REFERENCES

1. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

2. Mansfield: Micro Economics, WW Nortan & Company, Inc. New York.

3. Sudharam K.P.M. and Sundharam E.N., "Business Economics.

4. Mithani, D.M. and Murthy V.S. – Busines Economics.

5. Mehta, P.L. "Mangerial Economics, Sultan Chand & Sons.

Lesson: 22 -PROCEDURE FOR PRICE DETERMINATION

CONENTS

22.0 Aims and Objectives

22.1 Introduction

22.2 Guidelines for Price Determination

22.3 Principles of Price policy

22.4 Let us sum up

22.5 Lesson end activities

22.6 References

22.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able

- To Know the basic ideas to be followed while determining the price
- To Know the Principles of Price Policy

22.1 INTRODUCTION

Formulating price policies and fixing the price are the most crucial aspects of managerial decision making, Price which is an important device for the firm to maximize its revenue and also to widen its market. In this connection it is needed to understand some guidelines and principles to be followed while determining the price .

22.2 GUIDELINES FOR PRICE DETERMINATION

237

There is no specific procedure applicable to all firms for price determination however following steps may be followed to determine the price.

1. Determine demand for the product.

2. Anticipate and analyze the competitive reaction.

3. Establish expected share of the market.

4. Select pricing strategy.

5. Consider company's marketing policies.

1   Determining Demand for the Product

The marketer has to make out estimation for his product. Each price that the company might charges will lead to a different level of demand. There is a relation between the prices charged on the resulting demand. In the normal case, demand and price are inversely related, i.e., higher the price, lower the demand. There are two practical steps in demand estimation they are, first, to determine whether there is a price which the market expects and second, to estimate the sales volume at different prices. Comparison of the prices of rival products is a good guide in pricing products. In certain cases, the marketer conducts regular survey of potential buyers, retailers, and wholesalers etc., to determine the expected price. When we know the expected price, we can compute sales volume at different price levels. If demand is elastic rather than inelastic, sellers will consider lowering their price, to produce more total revenue. That is a product with elastic market demand. It is usually priced lower than the product with an inelastic demand.

2.   Anticipate and Analyze the Competitive Reaction.

The competitors can influence the price. Competition may arise from (1) similar products (2) close substitute and (3) unrelated products seeking the same consumer's disposable income. When the marketing field is easy to enter, then the number of competitors is greater, and there is a room for more revenue. To anticipate the reactions of the competitors, it is necessary to collect information about their product, cost structure, market share etc.

3.   Establish Expected Share of Market

A marketer must decide the share of the market at the expected price. Low priced products may capture larger share of the market, and a high priced product may capture a

238

small share of the market. Large share of the market can also be captured by advertisements and non-priced competition. Share of the market is also decided by the factors, such as present production capacity, cost of plant, extension etc.

4. Select Pricing Strategy

A good and proper pricing policy may be employed to achieve a predetermined share of the market. There are two methods:

(a)**Skimming Pricing:** This price strategy is characterized by high initial price of the product, at the time of introduction of the product in the market. Manufacturers aim at profit maximisation at the shortest period, where market conditions are also favorable. The price is brought down when competitors enter into the market field. Under this, the price is fixed high, because the product is characteristic for its distinctiveness and exclusiveness etc. Skimming is suitable for new products, because (1) at the initial stage, competition is at minimum, and the distinctiveness of the product leads the market, (2) if the market is unfavorable the price can be brought down easily. And at the same time, if the price is too low, it is very difficult to raise the price, (3) High price creates a vision of superior product.

(b)**Penetrating Price** : Price skimming strategy adopts a high introductory price to skim the milk of the market, whereas penetration pricing strategy adopts a low introductory price to speed up or capture the widespread market acceptance, penetrating pricing strategy is characterized by low initial price of the product, when introduced a the market. The aim is to catch the major portion of the market. The policy is satisfactory when (1) the cost of production comes down because of large-scale operations, (2) there is fear of stiff competition, (3) the product's demand is highly price elastic, (4) the public accepts the new product as a part of its daily life.

5. Consider Company's Marketing Policies

The price of product is influenced by the nature of product's durability-perishability or non-perishability. Perishable products have to be disposed of within a limited time e.g., fruits, milk, vegetables etc. Durable products e.g., car, radio, cloth, scooter etc., are concerned prices which need not be reduced. But when the fashion

239

changes, the marketer may compel the stockist to sell out the stocks before they become obsolescent.

Channels of distribution select the types of middlemen, and the gross marginal requirements of these middlemen will influence a manufacturer's price. Wholesalers as well as retailers may purchase from a producer, who often sets a different factory price for each of the above two. Larger the promotional methods used, larger will be the expenses and this will reflect in the manufacturer's price, as the set price has to cover the expenses.

22.3. PRINCIPLES OF PRICE POLICY

Dr. V.K.R.V. Rao has laid down the following basic principles of price policy:

1. **Equality in Increase of Income and Production**. Price Policy should be such that national income and national production should have equal increase. This will not take possibility of price increase. As such, the government should try that the increase in income should not be less than of production increase in a developing country; otherwise it will lead to rise in prices.

2. **Income Increase by Transfer**. In a developing economy, an increase in any class or sector necessarily should be by transfer of less income of other sector class otherwise increase in demand of a class and decrease in demand of another class will substitute and give birth to price rise i.e. inflationary impulse in the economy.

3.**Balance in Savings and Investment.** It should balance in savings and investment as far as possible otherwise decrease in savings, monetary fluctuation will result. In other words, saving must be matched with increased investment.

4.**Adequate Distribution Management.** If compulsory consumer goods supply is according to demand, there will be price stability. But, this is not possible in short time. Under such conditions, price control, distribution control and price encouragement policy should be used in coordination. To keep balance in demand and supply of compulsory

goods, proper rationing is must.

5. **Control over the Prices of Goods of Compulsory Consumption.**

In underdeveloped countries, inflation is caused by the increase in the prices of consumption goods and not by capitalized price increase. Hence, by price policy only compulsory consumer goods prices should be controlled. Further more, it gives birth to cost inflation and this type of rise in prices should be controlled immediately.

6. **Formation of Buffer Stock.** In developing countries, buffer stock should be created for controlling price increase caused due to draught, heavy rain, famine, and flood like sudden seasonal or temporary causes. During crisis such stock can supply the goods required.

22.4 LET US SUM UP

In this lesson we have studied the guidelines and principles that may be followed while determining the price of a product.

22.5 LESSON – END ACTIVITIES

1. Explain the guidelines that could be followed while determining the price

2. Discuss the various principles of price policy.

22.6 REFERENES

1. Mote, V.L., Samule Paula nd G.S. Gupta, Managerial Economics , Concepts and Cases, Tata McGraw Hill, New Delhi.

2. Mansfield: Micro Economics, WW Nortan & Company, Inc. New York.

3. Sudharam K.P.M. and Sundharam E.N., "Business Economics.

4. Mithani, D.M. and Murthy V.S. – Busines Economics.

5. Mehta, P.L. "Mangerial Economics, Sultan Chand & Sons.

Lesson: 23 - CAPITAL BUDGETING

CONTENTS

23.0 Aims and Objectives

23.0 AIMS AND OBJECTIVES

After having studied this lesson you should be able to

- To know the concept of Capital Budgeting

- To understand the importance of Capital Budgeting

- To familiarize the process involved in Capital Budgeting

23.1 INTRODUCTION

Every business has to decide upon its investment, as it involves high risk. An apt decision on investment program leads a business firm to achieve its high profit; hence a methodology to assist the management to take correct decision on its investment proposals is quintessential for which capital budgeting technique would assist. Capital budgeting is concerned with designing and carrying through a systematic investment program.

23.2 MEANING AND NATURE OF CAPITAL BUDGETING

Capital budgeting is the process of making investment decisions in capital expenditures. A capital expenditure may be defined as an expenditure the benefits of which are expected to be received over period of time exceeding one year. The main characteristic of a capital expenditure is that the expenditure is incurred at one point of time whereas benefits of the expenditure are realized at different points of time in future. The simple language we may say that a capital expenditure is an expenditure incurred for acquiring or improving the fixed assets, the benefits of which are expected to be received oven number of years in future. The following are some of the examples of capital expenditure

(1) Cost of acquisition of permanent assets as land and building, plant and machinery, goodwill, etc

(2) Cost of addition, expansion, improvement or alteration in the fixed assets.

(3) Cost of replacement of permanent assets.

(4) Research aid development project cost, etc.

Capital expenditure involves non-flexible long-term commitment of funds. Thus, capital expenditure decisions are also called as long term investment decisions. Capital budgeting involves the planning and control of capital expenditure. It is the process of deciding whether or not to commit resources to a particular long term project whose benefit are to be realized over a period of time, longer than one year. Capital budgeting is also known as Investment Decision Making, Capital Expenditure Decisions, Planning Capital Expenditure and Analysis of Capital Expenditure.

Charles T. Horngreen has defined capital budgeting as, "Capital budgeting is long term planning for making and financing proposed capital outlays"

According to G.C Philippatos, "Capital budgeting is concerned with the allocation of the firm's scarce financial resources among the available market opportunities. The consideration of investment opportunities involves the comparison of the expected future streams of earnings from a project with the immediate and subsequent streams of earning from a project, with the immediate and subsequent sreams of expenditures for it".

Richard and Great law have referred to capital budgeting as acquiring inputs with long-run return." In the words of Lynch, "Capital budgeting consists in planning development of available capital for the purpose of maximising the long term Profitability of the concern."

From the above description, it may be concluded that the important features which distinguish capital budgeting decision from the ordinary day today business decisions are:

1. Capital budgeting decisions involve the exchange of current funds for the benefits to be achieved in future.

2. The future benefits are expected to be realized over a series of years.

3. The funds are invested in non-flexible and long term activities.

4. They have a long term and significant effect on the profitability of the concern.

243

5. They involve, generally, huge funds.

6. They are strategic' investment decisions, involving large sums of money, major departure from the past practices of the firm, significant change of the firm's exported earnings associated with high degree of risk, as compared to 'tactical' investment decisions which involve a relatively small amount of funds that do not result in a major departure from the past practices of the firm.

23.3 NEED AND IMPORTANCE OF CAPITAL BUDGETING

Capital budgeting means planning for capital assets. Capital budgeting decisions are vital to any organizational as they include the decisions as to:

(a) Whether or not funds should be invested in long term projects such as setting of an industry, purchase of plant and machinery etc.

(b) Analyse the proposal for expansion or creating additional capacities.

(c) To decide the replacement of permanent assets such as building and equipment.

(d) To make financial analysis of various proposals regarding capital investments so as to choose the best out of many alternative proposals.

The importance capital budgeting can be well understood from the fact that an unsound investing decision may prove to be fatal to the very existence of the concern. The need, significance or importance of capital budgeting arises mainly due to the following:

1. Large Investment. Capital budgeting decisions, generally, involve large investment of funds.But the funds available with the firm are always limited and the demand for funds far exceeds the recourses. Hence, it is very important for a firm to plan and control its espial expenditure.

2. Long-term Commitment of Funds. Capital expenditure involves not only large amount of funds but also funds for long-term or more or less on permanent basis. The long-term, commitment of funds increases the financial risk involved in the investment decision, greater the risk involved, greater is the need for careful planning of capital expenditure i.e. Capital budgeting.

244

3. Irreversible nature. The capital expenditure decisions are of irreversible nature. Once the decision for acquiring a permanent asset is taken, it becomes very difficult dispose of these assets without incurring heavy losses.

4. Long-term effect on Profitability. Capital budgeting decisions have a long-term and significant effect on the profitability of a concern. Not only the present earnings of the firm are affected by the investments in capital assets but also the future growth and profitability of the firm depends upon the investment decision taken today. An unwise decision may prove disastrous and fatal to the very existence of the concern. Capital budgeting is of utmost importance to avoid over investment or under investment in fixed assets.

5. Difficulties of investment Decisions. The long term investment decisions are difficult to be taken because (i) decision extends to a series of years beyond the current accounting period, (ii) uncertainties of future and (iii) higher degree of risk.

6. National Importance. Investment decision though taken by individual concern is of national importance because it determines employment, economic activities and economic growth.

Thus, we may say that without using capital budgeting techniques a firm may involve itself in a losing project. Proper timing of purchase, replacement, expansion and alternation of assets is essential.

23.4 CAPITAL BUDGETING PROCESS

Capital budgeting is a complex process as it involves decisions relating to the investment of current funds for the benefit to the achieved in future and the future is always uncertain. However, the following procedure may be adopted in the process of capital budgeting:

1. Identification of Investment Proposals. The capital budgeting process begins with the identification of investment proposals. The proposal or the idea about potential investment opportunities may originate from the top management or may come from the rank and file worker of any department or from any officer of the organization.

The departmental head analyses the various proposals in the light of the corporate strategies and submits the suitable proposals to the Capital Expenditure Planning Committee in case of large organizations or to the officers concerned with the process of long-term investment decisions.

2. Screening the Proposals, The Expenditure Planning Committee screens the various us proposals received from different departments. The committee views these Proposals from various angles to ensure that these are in accordance with the corporate strategies or selection criterion of the firm and also do not lead to departmental imbalances.

3. Evaluation of Various Proposals. The next step in the capital budgeting process is to evaluate the profitability of various proposals. There are many methods which may be used for this purpose such as pay back period method, rate of return method, net present value method, internal rate of return method etc.

It should, however, be noted that the various proposals to the evaluated may be classified as:

(i) Independent proposals (ii) Contingent or dependent proposals and (iii) Mutually exclusive proposals.

Independent proposals are those which do not compete with one another and the same may be either accepted or rejected on the basis of a minimum return on investment required. The contingent proposals are those whose acceptance depends upon the acceptance of one or more other proposals, e.g., further investment in building or machineries may have to under taken as a result of expansion programme. Mutually exclusive proposals are those which compete with each other and one of those may have to be selected at the cost of the other.

4. Fixing Priorities after evaluating various proposals, the unprofitable or uneconomic proposals may be rejected straight away. But it may not be possible for the firm to invest immediately in all the acceptable proposals due to limitation of funds. Hence, it is very essential to rank the various proposals and to establish priorities after considering urgency, risk and profitability involved therein.

5. Final approval and preparation of Capital Expenditure Budget. Proposals meeting the evaluation and often criteria are finally approved to be included in the

Capital Expenditure Budget However; proposals involving smaller investment may be decided at the lower levels for expeditious action. The capital expenditure budget lays down the amount of estimated expenditure to be incurred on fixed assets during the budget period.

6. Implementing Proposal. Preparation of a capital expenditure budgeting and incorporation of a particular proposal in the budget does not itself authorise to go ahead with the implementation of the project. A request for authority to spend the amount should further be made to the Capital Expenditure Committee which may like to review the profitability of the project in the changed circumstances.

Further, while implementing the project, it is better to assign responsibilities for completing the project within the given time frame and cost limit so as to avoid unnecessary delays and cost over runs. Network techniques used in the project management such as PERT and CPM can also be applied to control and monitor the implementation of the projects.

7. Performance Review The last stage in the process of capital budgeting is the evaluation of the performance the project. The evaluation is made through post completion audit by way of comparison of actual expenditure on the project with the budgeted one, and also by comparing the actual return from the investment with the anticipated return. The unfavorable variances, if any should be looked into and the causes of the same be identified so that corrective action may be taken in future.

23.5 LET US SUM UP

In this lesson we have studied the meaning, nature and importance of capital budgeting in a detailed manner. We have also analysed the process involved in capital budgeting.

23.6 LESSON – END ACTIVITIES

1. Define Capital Budgeting

2. Define the term Capital Expenditure

3. List the Importance of Capital Budgeting

4. Discuss the procedure that may be adopted in the process of capital budgeting

23.7 REFERENCES

1. Sudharam K.P.M. and Sundharam E.N., "Business Economics.

2. Mithani, D.M. and Murthy V.S. – Busines Economics.

3. Mehta, P.L. "Mangerial Economics, Sultan Chand & Sons.

Lesson: 24 -EVALUATION   OF INVESTMENT PROPOSALS

CONTENTS

24.0 Aims and Objectives

24.1 Introduction

24.2 Methods of capital Budgeting

24.3 Traditional Methods

24.4 Time Adjusted Methods

24.5 Let us sum up

24.6 Lesson end activities

24.7 References

24.0 AIMS AND ACTIVITIES

After having studied this lesson you should be able

- To know the various methods available for evaluating investment proposals
- To analyse the merits and demerits of various methods of capital budgeting

24.1 INTRODUCTION

At each point of time a business firm has a number of proposals regarding various projects in which it can invest funds. But the funds available with the firm are always limited and it is not possible to invest funds in all the proposals at a time. Hence, it is very essential to select from amongst the various competing proposals, those which give the highest benefits. The crux of the capital budgeting is the allocation of available resources to various proposals. There are many considerations economic as well as non-economic, which influence the capital budgeting decisions. The crucial factor that influences the capital budgeting decision is the profitability of the prospective investment. Yet the risk involved in the proposal cannot be ignored because profitability and risk are directly related. i.e. Higher the profitability, the greater the risk and vice-versa.

24.2 METHODS OF CAPITAL BUDGETING

There are many methods of evaluating profitability of capital investment proposals. The various commonly used methods are as follows:

(A)   Traditional methods:

(1) Pay-back Period method or Pay out or Pay off method.

(2) Improvement of Traditional Approach to Payback Period Method.

(3) Rate of Return Method or Accounting Method.

(B)   Time -adjusted method or discounted Methods:

(4) Net present Value Method.

(5) Internal Rate of Return Method.

(6) Profitability Index Method.

24.3 TRADITIONAL METHODS:

1. Pay-Back Period Method

The 'Pay back' sometimes called as pay out or pay off period method represents the period in which the total investment in permanent assets pays back itself. This method is based on the principle that every capital expenditure pays itself back within a certain period out of the additional earrings generated from the capital assets. Thus, it measures the period of time for the original cost of a project to be recovered from the additional earnings of the project itself. Under this method, various investments are ranked according to the length of their pay back period in such a manner that the investment with a shorter pay back period is preferred to the one which has longer pay back period.

In case of evaluation of a single project, it is adopted if it pays back for itself with in a period specified by the management and if the project does not pay back itself with in the period specified by the management then it is rejected.

The pay-back period can be ascertained in the following manner:

(1)   Calculate annual net earnings (profits) before depreciation and after taxes; these are called annual cash inflows.

(2) Divide the initial outlay (cost) of the project by the annual cash in flow, where the project generates constant annual cash inflows. Thus, where the project generates constant cash inflows.

Pay-back period

=   Cash Outlay of the project or Original cost of the Asset
───
                       Annual Cash Inflows

250

(3)   Where the annual cash inflows (Profit before depreciation and after taxes) are unequal, the pay-back period can be found by adding up the cash inflows until the total is equal to the initial cash outlay of project or original cost of the asset.

Example. A project costs Rs. 1, 00,000 and yields m annual cash inflow of Rs. 20,000 for 8 years. Calculate its pay-back period.

Solution:

The Pay-back period for the projects is as follows:

Pay back Period = $\dfrac{\text{Initial Outlay of the Project}}{\text{Annual Cash Inflow}}$

$\dfrac{1, 00,000}{20,000}$ = 5 years

Advantages of Pay-back Period method

(1) The main advantage of this method is that it is simple to understand and easy to calculate.

(2) It saves in cost; it requires lesser time and labour as compared to other methods of capital budgeting.

(3) In this method, as a project with a shorter pay-back period is preferred to the one having a longer pay-back period it reduces the loss through obsolescence and is more suited to the developing countries, like India, which are in the process of development and have quick obsolescence.

(4) Due to its short term approach, this method is particularly suited to a firm which has shortage of cash or whose liquidity position is not particularly good.

Disadvantages of Pay-back Method

Though pay-back period method is the simplest, oldest and most frequently used method, it suffers from the following limitations:

(1)   It does not take into account the cash inflows earned after the pay back period and hence the true profitability of the projects cannot be correctly assessed.

(2) This method ignores the time value of money and does not consider the magnitude and timing of cash in flows. It treats all cash flows as equal though they occur in different periods. It ignores the fact that cash received today is more important than the same amount of cash received after, say 3 years.

(3) It does not take-into consideration the cost of capital which is a very important factor in making sound investment decisions.

(4) It may be difficult to determine the minimum acceptable pay-back period; it is usually, a subjective decision.

(5) It treats each asset individually in isolation with other assets which is not feasible in real practice.

(6) Pay-back period method does not measure the true profitability of the project as the period considered under this method is limited to a short period only and not the full life of the asset.

In spite of the above mentioned limitations, this method can be used in evaluating the profitability of short term and medium term capital investment proposals.

2. Improvements in Traditional Approach to Pay Back Period Method

(**a**) **Post Pay-back Profitability Method**. One of the serious limitations of Pay-back period method is that it does not take into account the cash inflows earned after pay-back period and hence the true profitability of the project cannot be assessed. Hence, an, improvement over this method can be made by taking into account the returns receivable beyond the pay-back period. These returns are called post pay-back profits.

(**b**) **Pay-back Reciprocal Method.** Sometimes, Pay-back Reciprocal method is employed to estimate the internal rate of return generated by a project. Pay-back Reciprocals can be calculated as under:

$$\text{Pay back Reciprocal} = \frac{\text{Annual Cash Inflow}}{\text{Total Investment}}$$

(This can also be calculated in percentage by multiplying the above by 100). However, this method should be used only when the following two conditions are satisfied:

252

(i)   Equal cash inflows are generated every year.

(ii) The project under consideration has a long life which must be at least twice the pay-back period.

(c) Post Pay-back Period Method. One of the limitations of the pay-back period method is that is it ignores the life of the project beyond the pay-back period. Post Pay-back Period method takes into account the period beyond the pay-back method. This method is also known as Surplus Life over Pay-back method. According to this method, the project which gives the greatest post pay-back period may be accepted. The method can be employed successfully where the various projects under consideration do not differ significantly as to their size and the expected cash inflows are even throughout the life of the project.

(d) Discounted Pay- back Method. Another serious limitation of the pay-back period method is that it ignores the time value of money. Hence, an improvement over this method can be made by employing the discounted pay-back period method. Under this method the present values of all cash outflows and inflows are computed at an appropriate discount rate. The present values of all inflows are cumulated in order of time. The time period at which the cumulated present value of cash inflows equals the present value of cash outflows is known as discounted pay-back period. The project which gives a shorter discounted pay-back period is accepted.

3. Rate of Return Method: This method takes in to account the earnings expected from the investment over their whole life. It is known as Accounting Rate of Return method for the reason that under this method, the accounting concept of profit (net profit after tax and depreciation) is used rather than cash inflows. According to this method, various projects are ranked in order of the rate of earnings or rate of return. The project with the higher rate of return is selected as comported to the one with lower rate of return. This method can also be used to make decision as to accepting or rejecting a proposal. The expected return is determined and the project which has a higher rate of return than the minimum rate specified by the firm called the cut off rate is accepted and the one which gives a lower expected rate of return than the minimum rate is rejected.

The return on investment method can be used in several ways as follows:

(a) Average Rate of Return Method. Under this method average profit after tax and depreciation is calculated and then it is vided by the total capital outlay or total investment in the project. In other words, it establishes the relationship between average annual profits to total investments.

Thus:

Average rate of return

$$\frac{Total\ \ profits\ (After\ dep\ \&\ Tax\ )}{Net\ investment\ in\ the\ project \times No\ of\ \ years} \times 100$$

or

$$\frac{Average\ Annual\ \ \ \ profits}{Net\ investment\ in\ the\ project} \times 100$$

(b) Return per unit of Investment Method. This method is small variation of the average rate of return method. In this method the total profit after tax and depreciation is divided by the total investment, i.e.,

Return per unit of Investment Method

$$= \frac{Total\ \ \ \ profits\ (after\ dep.taxes)}{Net\ investment\ in\ the\ project} \times 100$$

(c) Return on Average Investment Method- In this method the return on average investment is calculated. Using of average in vestment for the purpose of return on investment is preferred because the original investment is recovered over the life of the asset on account of depreciation charges.

(d) Average Return on Average Investment Method. This is the most appropriate method of rate or return on investment. Under this method, average profit after depreciation and taxes is divided by the average amount of investment; thus:

Average Return on Average Investment

$$= \frac{Aveerage\ annual\ \ profits\ (after\ dep.taxes)}{Averege\ investment} \times 100$$

254

$$= \frac{Aveerage\ annual\ profits}{\dfrac{Averege\ investment}{2}} \times 100$$

Advantage of Rate or Return Method

(1) It is very simple to understand and easy to operate.

(2) It uses the entire earnings of a project only the earnings unto pay-back period and hence gives a better view of profitability as compared to pay-back period method.

(3) As this method is based upon accounting concept of profits, it can be readily calculated from the financial data.

Disadvantages of Rate of Return Method

(1) This method also like pay-back period method ignores the time value of money as the profits earned at different points of time are given equal weight by averaging the profits. It ignores the fact that a rupee earned today is of more value than a rupee earned a year after, or so.

(2) It does not take into consideration the cash flows which are more important than the accounting profits.

(3) It ignores the period in which the profits are earned as a 20% rate of return in 27 years may be considered to be better than 18% rate of return for 12 years. This is not proper because longer the term of the project, greater is the risk involved.

(4) This method cannot be applied to a situation where investment in a project is to be made in parts.

24.4 TIME-ADJUSTED OR DISCOUNTED CASH FLOW METHODS

The traditional methods of capital budgeting i.e. pay-back method as well as accounting rate of return method, suffer from the serious limitations that give equal weight to present and future flow of incomes. These methods do not take into consideration the time value of money, the fact that a rupee earned today has more value than a rupee earned it after five years. The time-adjusted or discounted cash flow methods take into amount the profitability and also the time value of money. These methods also called modern methods of capital budgeting are becoming increasingly popular day by day. Following are the discounted cash flow methods:

4. Net present value method

The net present value method is a modern method of evaluating investment proposals. This method takes into consideration the time value of money and attempts to calculate the return on investments by introducing the factor of time element. It recognizes the fact that a rupee earned today is worth more than the same rupee earned tomorrow. The net present values of all inflows and outflows of cash occurring during the entire life of the project is determined separately for each year by discounting these flows by the firm's cost of capital or a pre-determined rate. The following are the necessary steps to be followed for adopting the net present value method of evaluating investment proposals

(i) First of all determine an appropriate rate of Interest that should be selected as the minimum require rate of return called cut -off rate or discount rate. The rate should be a minimum rate of return below which the investor considers that it does not pay him to invest. The discount rate should be either the actual rate of interest in the market on long-term loans or it should reflect the opportunity cost of capital of the investor.

(ii) Compute the present value of total investment outlay, i. e. cash outflows at the determined discount rate. If the total investment is to be made in the initial year, the present value shall be the same as the cost of investment.

(iii) Compute the present values of total investment proceeds, cash inflows, (profit before depreciation and after tax) at the above determined discount rate.

(iv) Calculate the present value of each project by subtracting the present value of cash inflows from the present value of cash outflows for each project.

(v) If the net present value is positive or zero, i.e., when present value of cash inflows either exceeds of is equal to the present values of cash outflows, the proposal may be accepted But in case the present value of inflows is less than the present value of cash outflows, the proposal should be rejected.

(vi) To select between mutually exclusive projects, projects should be ranked in order of net present values, i. e. the first preference should be given to the project having the maximum positive net present value.

The present value of Re. 1 due in any number of years can be found with the use of the following mathematical formula:

$$PV = \frac{1}{(1+r)^n}$$

Where

PV = present value

r = rate of interest/discount rate

n = number of years

The present value for all the cash inflows for a number of years in thus found as follows:

$$PV = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots\ldots\ldots\ldots\ldots \frac{A_n}{(1+r)^n}$$

$$= A_1, A_2, A_3,\ldots\ldots\ldots\ldots\ldots A_n$$

Future net cash flows (profit after tax but before depreciation)

r = rate of interest

2, 3, ……….. and n = numbers of years.

Advantages of the Net Present Value Method

The advantages of the net present value method of evaluating investment proposals are as follows:

(1) It recognizes the time value of money and is suitable to be applied in a situation with uniform cash outflows and uneven cash inflows or cash flows at different periods of time.

(2) It takes into account the earnings over the entire life of the project and the true profitability of the investment proposal can be evaluated.

(3) It takes into consideration the objective of maximum profitability.

Disadvantages of the Net Present Value Method

The net present value method suffers from the following limitations:

(1) As compared to the traditional methods, the net present value method is more difficult to understand and operate.

(2) It may not give good results while comparing projects with unequal lives as the project having higher net present value but realized in a longer life span

257

may not be as desirable as a project having something lesser net present value achieved in a much shorter span of life of the asset.

(3)   In the same way as above, it may not give good results while comparing projects with unequal investment of funds.

(4)   It is not easy to determine an appropriate discount rate.

5   Internal Rate of Return Method

The internal rate of return method is also a modern technique of capital budgeting that takes into account the time value of money. It is also known as 'time adjusted rate of return' discounted cash flow' 'discounted rate of return,' 'yield method,' and 'trial and error yield method'. In the net present value method the net present value is determined by discounting the future cash flows of a project at a predetermined or specified rate called the cut-off rate. But under the internal rate of return method, the cash flows of a project are discounted at a suitable rate by hit and: trial method, which equates the net present value so calculated to the amount of the investment. Under this method, since the discount rate is determined internally, this method is called as the internal rate of return method. The internal rate of return can be defined »that rate of discount at which the present value of cash-inflows is equal to the preset value of cash outflows. It can be determined with the help of the following mathematical formula.

$$PV = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + \frac{A_3}{(1+r)^3} + \ldots\ldots\ldots\ldots \frac{A_n}{(1+r)^n}$$

Where,   C   = Initial Outlay at time Zero.

A1, A2,……….An   = Future net cash flows at different periods.

2, 3,………..   = number of years

                                    r   = rate of discount of internal rate of return.

The internal rate of return can also be determined with the help of present value tables. The following steps are required to practice the internal rate of return method.

(1)   Determine the future net cash flows during the entire economic life of the project. Ha cash inflows are estimated for future profits before depreciation but after taxes.

258

(2) Determine the rate of discount at which the value of cash inflows is equal to the preset value of cash outflows. This may be determined as explained after step (4).

(3) Accept the proposal if the internal rate of return is higher than or equal to the minimum squired rate of return, i.e. the cost of capital or cut off rate and reject the proposal «f tie internal rate of return is lower than the cost of cut-off rate.

(4) Incase of alternative proposals select the proposal with the highest rate of return as lag as the rates are higher than the cost of capital or cut-off-rate.

Determination of Internal Rate of Return (IRR)

(a)   When the annual net cash flows are equal over the life of the assets:

Firstly, find out present Value Factor by dividing initial outlay (cost of the investment i by annual cash flow, i.e...

$$\text{Present Value Factor} = \frac{\text{Initial Quality}}{\text{Annual cash Flow}}$$

(b)   When the annual cash flows are unequal over the life; f the asset :

In case annual cash flows are unequal over the life of the asset fie internal rate of return cannot be determined according to the technique suggested above In such cases, the internal rate of return is calculated by hit and trial and that is % this method is also known as hit and trial yield method. We may start with any assumed discount rate and find out the total present value of cash outflows which is equal to the cost of the initial investment where total investment is to be made in the beginning The rate at which the total present value of all cash inflows equals the initial outlay, is the internal rate of return. Several discount rates may have to be tried until the appropriate rate is found. The calculation process may be summed up as follows;

(i)   Prepare the cash flow table using an arbitrary assumed discount rate to discount the net cash flows to the present value.

(ii) Find out the Net Present Value by deducting from the present value of total cash flows calculated in (i) above the initial cost of the investment.

(iii) If the Net Present Value (NPV) is positive, apply higher rate of discount.

(vi) If the higher discount rate still gives a positive net present value, increase the discount rate further until the NPV becomes negative

Advantages of Internal Rate of Return Method

The internal rate of return method has the following advantages :

(i)   Like the net present value method, it takes into account the turn value of money and be usefully applied in situations with even as well as un even cash flow at different periods of time.

(ii)   It considers the profitability of the project for its entire economic life and hence enables evaluation of true profitability.

(iii) The determination of cost of capital is not a pre-requisite for the use of this method and hence it is better than net present value method where the cost of capital cannot be determined easily.

(iv)   It provides for uniform ranking of various proposals due to the percentage rate of return.

(v)   This method is also compatible with the objective of maximum profitability and is considered to be a more reliable technique of capital budgeting.

Disadvantages of Internal Rate of Return Method

In spite of many advantages, it suffers from the following drawbacks.

(i)   It is difficult to understand and is the most difficult method of evaluation of investment proposals.

(ii)   This method is based upon the assumption that the earnings are reinvested at the internal rate of return for the remaining life of the project, which is not a justified assumption particularly when the average rate of return earned by the firm is not close to the internal rate of return. In this sense, Net Present Value method seems to be better as it assumes that the earnings are reinvested at the rate of firm's cost of capital.

(iii)   The results of NPV method and IRR method may differ when the projects under evaluation differ in their size, life and timings of cash flows.

6. Profitability Index Method or Benefit Cost Ratio

It is also a time -adjusted method of evaluating the investment proposals. Profitability index also called as Benefit-Cost Ratio (B/C) or 'Desirability factor' is the relationship between present value of cash inflows and the present value of cash outflows. Thus

$$\text{Profitability Index} = \frac{\text{Present Value of Cash inflows}}{\text{Present Value of Cash outflows}}$$

Or $$\text{P.I} = \frac{\text{PV of Cash inflows}}{\text{Initial Cash outlay}}$$

The profitability index may be found for net present values of inflows

$$\text{P.I (Net)} = \frac{\text{NPV (Net Present Value)}}{\text{Initial Cash Outlay}}$$

The net profitability index can also be found as Profitability Index (gross) minus one. The proposal is accepted if the profitability index is more than one and is rejected if index is less than one. The various projects are ranked under this method in order of their profitability index, in such a manner that one with higher profitability index is ranked higher than the other with lower profitability index.

24.5 LET US SUM UP

To evaluate the investment proposals broadly two methods are identified in this lesson, they are Traditional methods and Time adjusted or discounted cash flow methods. Moreover the advantages and disadvantages of each method to evaluate the investment alternatives are also discussed in detail.

24.6 LESSON – END ACTIVITIES

1. Explain pay back period method of appraising capital expenditure projects and list its merits and demerits

2. Discuss IRR method of evaluating investment proposals

3. Explain NPV method of capital budgeting and what are its advantages?

24.7 REFERENES

1. Pandey I.M., "Financial Management, Vikas Publishing Co.

2. Charles J. Stokes: Economics for Managers Intl. Student Edition, McGraw Hill, Kogakusha Ltd.

3. J. harrvey and M. Johnson, "Introduction to Macro Economics" MacMillan.

Lesson: 25 -NATIONAL INCOME

CONTENTS

      25.0 Aims and Objectives

25.0 AIMS AND OBJECTIVES

After having studied in this lesson you should be able

- To understand the concept of National Income
- To analyse the vital role of NI in the economic theory
- To identify methods of calculating NI

25.1 INTRODUCTION

The term National Income is used to refer the money value of the total income of the economy in a year. In common parlance national income means the total value of goods and services produced annually in a country. In other words the total amount of income accruing to a country from economics activities in a year's time is known as national income. Firstly it measures the market value of annual product. Secondly National income is a monetary measure. Thirdly national income includes the market value of all final goods the value of intermediate products are not included. A final product is one which is available for immediate consumption. For example, a shirt or a sewing machine. The example of intermediate product is raw materials.

25.2 DEFINITIONS OF NATIONAL INCOME

The definitions of National income can be grouped into two classes as the traditional definition advanced by Marshall, Pigou and Fisher and the modern definitions.

Marshallion Definition:- According to Marshall, the labour and capital of a 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 true net annual income or revenue of the country or national dividend.

Pigovian Definition:- According to Pigou "National income is that part of objective income of the community, including of course income derived from abroad which can be measured in money"

Fisher's Definition:- Fisher adopted consumption as the criterion of national certain whereas Marshall and Pigou regarded it to be production.

According to Fisher 'The national income consists solely of services as received by ultimate consumers whether from their material or from their human environment'.

From the modern point of view national income is defined as the net output of commodities and services flowing during the year from country's productive system in the hands of ultimate consumer.

25.3 CIRCULAR FLOW OF INCOME

The total income obtained as wages, rent, interest and profits are the national income of the country. Various households get their income from the firms for the production of goods and services. The value of all the goods produced is the national product. Thus the total national product produced by firms in a year is distributed to all factors in the form of wages, interest rent and profits. The sum of all these factors income will be equal to the national income. Thus the national product is equal to the national income.

National Income = Wages + Rent + Interest + profit

National income = Domestic income + Net income from abroad.

Personal Income = Domestic income + Net income from abroad + Transfer Payments + Net interest on borrowings + Unearned income - Taxes on profit - Undistributed profit - Contribution to social security measures.

25.4 METHODS OF MEASUREMENT OF NATIONAL INCOME

There are three methods to calculate the national income of a country. They are:

1. Product or inventory method: Under this method national income is computed by adding the net value of all commodities and services produced during a given period. Thus national income is equal to the total of final products. We first estimate the gross value of domestic output in the various sectors of production (Agriculture, manufacturing industry, and services including government). The value of gross output is obtained by multiplying the output of each sector by their respective market prices and adding them together. Then we deduct value of depreciation from gross value of domestic output. The figure so obtained has to be adjusted with net income from abroad. This is the national income at factor cost. This method is also known as output method or value added method.

This method is very complicated because of non-availability of adequate and requisite data. It is also difficult to calculate depreciation.

2. **Income Method:** Under this method the national income of a country is obtained by adding the incomes accrue to factors of production within the national territory. Basic factors of production used producing the national products are land, labour, capital and organisation. The national income is equal to total rent plus total wages and salaries of all employees including income of self employed persons plus total interest on capital including dividends of the shareholders plus total profit of all firms including undistributed corporate profits and earnings of public enterprises. In short, the national income represents the total of rent, wages, interest and profit.

It is difficult to make distinction between the earnings from ordinary labour and organisational efforts. It is also difficult to make distinction between earnings from land and capital. Therefore factors of production are grouped as labour and capital for purposes of estimating national income.

Under this method, the income earned by all individuals of the country during a year is taken. Individuals earn income in the form of Rent, profit, wages, and salaries and interest. This method is called income method.

3. Expenditure method: This method is based on the assumption that income is equal to expenditure plus savings. Under this method the personal consumption expenditure, government purchase of goods and services, gross private domestic investment and net

265

foreign investment are added together to get the national income of a country. This method is also known as consumption- saving method.

The expenditure method is not generally used because the necessary data regarding consumption expenditure are not easily available.

This method includes the total expenditure of a country during a given year. The income is spent on consumer goods or on producer goods. The consumption expenditure and investment expenditure of all the individuals in a government during a year is added. Thus

National Income = Consumption Expenditure + Investment Expenditure + government expenditure + exports - imports.

$$Y = C + I + G + X\text{-}M$$

4.   Value Added Method

Another method of measuring national income is the value added by industries. The difference between the value of material output and input at each stage of production is the value added. If all such differences are added up for all industries in the economy we arrive at the gross domestic product.

25.5 CONCEPTS OF NATIONAL INCOME

There are various concepts of national income

1.   Gross National Product (GNP)

Gross national product is defined as the total market value of all final goods and services produced in a year. GNP includes four types of final goods and services, (i) Consumer goods and services to satisfy the immediate wants of the people (ii) gross private domestic investment on capital goods consisting of fixed capital formation, residential constructions and inventories of finished and unfinished goods, (iii) goods and services produced by government and (ir) net export of goods and services'

GNP = government production + private output

2.   Net National Product (NNP)

The second concept is Net National Product. The capital goods like machinery wear out as a result of continuous use. This is called depreciation. This is also called National income at market prices. Hence NNP = GNP - depreciation.

3.   National Income at factor cost

National income at factor cost denotes the sum of all incomes earner by the factors. GNP at factor cost is the sum of the money value of the income produced by and accruing to the various factors of production in one year in a country. It includes all items of GNP less indirect tax. GNP at market price is always more than GNP at factor cost as GNP at factor cost is the income which the factors of production receive in return for their service alone.

National income at factor cost = net national product - indirect taxes + subsidies.

4.   Personal Income (PI)

Personal income is the sum of all incomes received by all individuals during a given year. Some incomes such as Social security contribution are not received by individuals, similarly some incomes such as transfer payments are not currently earned, for example Old Age Pension. Therefore,

Personal income   =   national income - social security contribution

- Corporate income taxes - undistributed corporate profit + transfer payment.

5.   Disposable Income (DI)

Disposable income = personal income - personal taxes

After a part of the income is paid to the Government in the form of taxes, the remaining income is called disposable income.

25.6 DIFFICULTIES IN THE MEASUREMENT OF NATIONAL INCOME

There are certain difficulties in the measurement of National Income. They are given below:,

1. The National Income must be calculated in monetary terms. There are certain nonmonetary transactions which are not included in the value of product. For example the unpaid personal services of a housewife cannot be included in the national product.

267

2. The Government services such as justice .administration and defence should he treated as equivalent to any other capital formation.

3. The treatment of profits of foreign firms as income of the parent country is another difficulty in measurement, because the foreign firms production is taking place in India while the profits of the firm is not considered in the income calculation of the country.

4. In underdeveloped countries like India, the major part of the output does not come to the market due to non monitised transaction. This results in the underestimation of the National Income.

5. Due to illiteracy regular accounts are not kept by the producers. This also makes the national income calculation more difficult.

6. The agriculture and industrial sectors are unorganized and scattered in India.

7. Finally the lack of statistical data and unreliability of statistics is the major difficulties in measuring the National Income.

8. A Greatest difficulty in calculating the national income is of double counting which arises from the failure, to distinguish properly, between a final and intermediate product.

9. Income earned through illegal activities such as gambling or illicit extraction of wine etc is not included in national income. Such goods and services do have value and meet the needs of consumers. But by leaving them out, national income works out to less than actual.

10. There arises difficulty of including transfer payments in the national income. Individuals get pension, unemployment allowance and interest on public loan's but whether these should be included on the national income in a difficult problem.

11. Another difficulty in calculating national income is that of price changes which fail to keep stable the measuring rod of money for national income. When the price level in the country rises the national income also shows an increase even though production might have fallen.

Thus the above difficulties involved in National Income analysis are both statistical and conceptual. Therefore the National Income cannot be calculated accurately.

25.7 SIGNIFICANCE OR IMPORTANCE OF NATIONAL INCOME ESTIMATES

The following are the main uses of national income analysis:

1. The national income estimate reveals the overall production performance of the economy. It records the level of production in each year. This enables to compare the real growth of the economy over the years.

2. The percapita income measures the average standard of living of the people. It is used to compare standards of living in different countries.

3. National income data are used to measure economic welfare of the community. Other things being equal, economic welfare is greater if rational income is higher and vice versa.

4. The study of national income statistics is useful in diagnosing the economic ills of a country and suggesting remedies.

5. The national income figures are useful in assessing the pace of economic development of a country.

6. The national income figures are used to assess the savings and investment potential of the community. The rate of saving and investment depend on national income.

7. The comparison of rational income over the years enables to know the nature of the economy. This is important when the government of a country launches planning for economic development. In factor planning is possible without national income estimates.

8. National income estimates show the contribution made by different sectors of f he economy such as agriculture, industry, trade and commerce, service etc. On the basis of national income figures.

9. National income estimates will tell us how far different categories of income such as rent, wages, interest, and profits are contributing to national income.

10. The formulation of panning for different sectors of the economy is based on the national income figures. National income estimates are very useful in formulating plans for the development of agriculture, industry, infrastructure etc.

11.   We can evaluate the achievements of the development targets laid down in the plus from the changes in national income and various components.

12.   National income data are useful for forecasting future economic events.

13.   National income statistics can be used to determine how an international financial burden should be apportioned between different countries.

14.   In war time the study of the components of national income is of great importance because they show the maximum production possibilities of the country.

25.8 LIMITATIONS OF NATIONAL INCOME ESTIMATES

Undoubtedly, the national income data are highly useful for several purposes. But we should take much care while using the national income figures. They cannot be taken as absolutely reliable. They suffer from the following limitations.

1.   Comparisons of income are valid only for short period, say, four or five years.   But over longer periods they may be misleading. Over a longer period, a number of new products may appear in the economy and a number of old products may disappear from the consumption.   Hence the real in come will change and the comparison will not have much meaning.

2.   It is difficult to compare the incomes of two countries of different economic systems.

3.   In underdeveloped countries, most production takes place in the hones of the people. But national income estimates are limited to goods and services sold in the market. Thus, statistics would omit the largest part of the real incomes of underdeveloped countries.

4.   The rational income figures measure money incomes rather than real incomes. There are some difficulties in the ascertainment of real income.

5.   They are only rough approximations. On their basis we cannot say that a certain policy will produce the desired result.

25.9 LET US SUM UP

In this lesson we studied the meaning of National Income and the definitions given by various economist. We also discussed the concept of circular flow of income. We have also studied the methods available to measure National Income and the difficulties while measuring. We have also discussed the importance of National Income estimates.

25.10 LESSON – END ACTIVITIES

1. Define National Income
2. Discuss the various methods of calculating the NI of a country.
3. What is the importance of NI Estimates?
4. What is circular flow of income
5. List the limitations of NI estimates.

25.11 REFERENCES

1. Misra, S.K. and Puri V.K. "Indian Economy, Himalaya Publishing House.

2. Dhingra, I.C., The Indian Economy, Sultan Chand & Sons.

3. Rangarajan, C. and Dholakia, B.H., Principles of Macro Economics, Tata McGraw Hill Publishing Co. Ltd.

4. Maurice Thomas: Managerial Economics.

5. Charles J. Stokes: Economics for Managers Intl. Student Edition, McGraw Hill, Kogakusha Ltd.

6. J. harrvey and M. Johnson, "Introduction to Macro Economics" MacMillan.