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Preface

Commerce is a applied branch of Economics. It helps to the commerce students to take business decisions in actual practices. Therefore, the Study of Applied Economics is essential to them. Applied Economics is also called Managerial Economics. It includes the various topics as Introduction to Managerial Economics, Demand analysis, Theory of consumer's Choice, Production theory, Different markets, Pricing practices, Business cycles, International Business Environment, International Marketing, International Business Regulations & Tuter national Economy & India, etc. This study is also very useful to Business Managers. The topics are in it explained with help of Tables, diagrams, mathematical equations, with simple language, which make subject matter very clear and easy to understand. So, we hope that this book will more useful to the teachers, students and readers in various fields.

I am grateful to all the writers, officers of distance education, printers and publishers those who participated in the publication of this books.

■ **Editor** ■

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M. Com. Part-I

SIM IN MANAGERIAL ECONOMICS

INDEX

Each Unit begins with the section objectives -

Objectives are directive and indicative of :

1. what has been presented in the unit and
2. what is expected from you
3. what you are expected to know pertaining to the specific unit, once you have completed working on the unit.

The self check exercises with possible answers will help you understand the unit in the right perspective. Go through the possible answers only after you write your answers. These exercises are not to be submitted to us for evaluation. They have been provided to you as study tools to keep you in the right track as you study the unit.

Dear Students

The SIM is simply a supporting material for the study of this paper. It is also advised to see the new syllabus 2022-23 and study the reference books & other related material for the detailed study of the paper.

Unit-1

Introduction to Managerial Economics

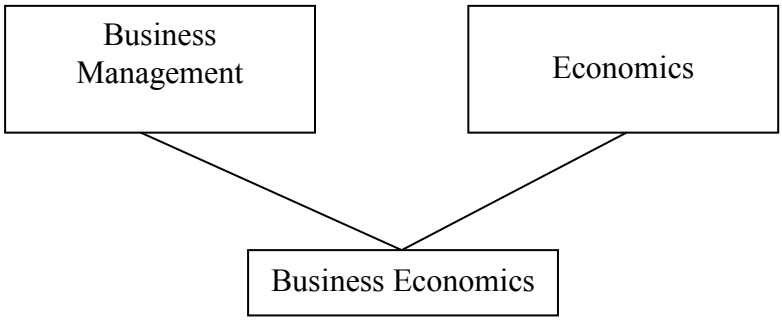
1.0 Objectives

1) To study the origin, nature and scope of Managerial Economics.
2) To study relationship between economic theory and managerial theory.
3) To study role and responsibilities of business manager.
4) To study various objectives of business firm.

1.1 Introduction

In 1951 Joel Dean published a book entitled "Managerial Economics." Then the subject Managerial Economics has gained popularity. Managerial Economics reveals that how economic analysis is used to formulate the economic' policies in respect to the business firms.

Managerial Economics was formerly known as "Business Economics." It is also called as "Applied Economics". The word Business Economics is formed from the two words Business and Economics.



In the word 'Business Economics' "Business" means a state of being busy. It means any activity continuously undertaken by a man in order to earn income.

In other words Business if referred to commercial activities aimed at making profit. The word Management is formed from the^ word 'to manage.' The meaning of the word "to manage" is to get the work done through others. Management is what brain is to the human body. Hence Business Management means any activity undertaken to earn profit, run by a person and managed with the help of economics. Therefore Managerial Economics is also called Business Economics.

In Managerial Economics the concepts, principles and theories in pure economic science are applied to any business activities. Therefore it is also called as Applied Economics. A manager of business firm manages the business with the help of economic theories. So it plays a vital part in running the business activities.

1.2 Definitions

The subject Managerial Economics is defined by many eminent scholars as follows.

1) According to 'E.T. Brigham' and "J. L. Pappas', "Managerial Economics is the application of Economic theory and methodoloty to business administration practice."

This definition throws light on the application of principles and theories of economics in practice to run successfully the business,

2) "McNair and Meriam' defined it as "Managerial Economics consists of-the use of Economic modes of thought to analyse business situations."

This definition stresses on how manager of business firm uses the economic thoughts and concepts to solve the problems prevailing in business activities. Everyday business manager has to face different problems, while running the business. They would be solved with the help. of economic theories.

3) 'M. H. Spencer' and "L. Siegelman' defined as "Managerial Economics is the intergration of economic theory with business practice for the purpose of facilitating decision making and forward planning."

This definition enlights the process of business decision making with the help of economic theories. Manager intergrates the economic theories with the business practices and takes decision as well as plans the activities of his business firm.

It is clear from the above definitions that Managerial Economics deals with the economic aspects of managerial decisions, which can be used by managers, while running the business activities. It is a midway between Economics and Business Management and serves as' a link between the two.

In Managerial Economics, economic theories and principles are put in relation to the real business behaviour and prevailing conditions. Analytical techniques in economic theory builds economic models by which we arrive at certain assumptions and conclusions. With the help of these assumption and conclusions, the problems faced by manager in his daily business activities would be solved. In practice, with the help of economic concepts of profit and costs, one can use the financial data more effectively to cope up with the needs of decision making and advance planning. Thus, Managerial Economics attempts to have conciliation between economic concepts and accounting concepts.

By using the economic concepts like elasticity of demand, cost and output etc. and their previous data business forecasts could be made.

Economics studies the concepts like business cycles; fluctuations in national income and government policies related to taxation, labour relations, anti-monopoly measures, foreign trade, licensing policies, price control etc.

The manager of a business firm has to see the relevance and effects of the external forces on business activities.

Thus managerial economics is related with the study of economic analysis applied to the real business activities in practice.

1.3 Features of Managerial Economics

Following are the main characteristic features of Managerial Economics which constitute the nature and subject matter.

1) Managerial Economics means the application of economic concepts, theories and principles to the business activities.

2) Managerial Economics is related with the micro-economics. It is micro in nature.

It is mainly related with the problems of individual unit.

3) Also it deals with the macro-economics. Manager of the farms has to study the macro economic concepts like National Income, Business Cycles, Labour Relations, Government Policies on taxation, budget, monetary issues and international trade etc. By studying these macro economic concepts Manager of a business firm takes the decisions in respect of his firm.

4) Managerial economics deals with the theory of firm which is pure theory of economics. Economic principles of .this theory are applied to his firm to decides it's profit. It means that managerial economics deals with the theory of distribution.

1.4 Nature and Scope of Managerial Economics

The subject matter of managerial economics deals with the economic aspects of managerial decisions. These economic decisions are based on the economic contents. Thus managerial economics is a body of knowledge techniques and practices based on those economic concepts which are useful in deciding the business strategy. Managerial behaviour involves planning motivation, co-ordination or control for

which economic considerations are required. It forms the subject matter of managerial economics.

According to 'J. L. Pappas' and 'E. T, Brigham', Managerial Economics is designed to provide a rigorous treatment of those aspects of economic theory and analysis that are most useful for managerial decision analysis.

Therefore, Managerial. Economics focuses on those tools and techniques which are useful in decision making.

Decision making is one-of the main functions of every manager. His decisions depends entirely upon himself or sometimes on other factors. The problems before him may be simple or complex in nature. Also they may be major or minor.. In order to .solve these problems decision making .and planning becomes the significant function of managerial persons. Decision making is the process of selecting one course of action from two or more alternative courses of action. It means that manager which solving the problems before his business firm, chosses one alternative out of various available alternatives, e.g. suppose in order to increase the sale of his product among many competitions in market, a manager of business firm have various alternatives available as to reduce the cost of production, to impose lower price, to increase the quality of his product to give incentives to the consumers who purchase his products, implementation of advertising techniques etc. Among these various alternatives he choose one of the alternative. The choice of one alternative increases the sale of his product in market is called the process of decision making.

After decision making he has the forward planning, it means establishing plants for the future, Both of these acts run one after the another.

Where in which the conditions, manager works-and takes decisions which are based on uncertainty. The fact of uncertainty makes the decision making and planning function more complex. If there is any future knowledge, plans might have been so constructed so as to give perfection without errors and no changes could be expected. In reality, the manager has no knowledge about the future as regards the sales, cost of production, capital investments. Therefore, all decisions are formulated -on past data available; current, information 'and the estimates about the predicated future. For the fulfillment of plans requires a time, during such period more facts come to be known and so there is a change in the plan and the course is vitiated. In

this way, at every stage, .the manager goes on through unending series of decision making with unknown and uncertain future and they have to adjust according to it.

Thus function of decision making under uncertainty conditions, the managers uses the economic theory with considerable advantage, economic theory has following concepts and principles relating to profit, demand, cost, pricing, production, competition, business cycles, national income. By using the Economic concepts and principles along with accounting, statistics and mathematics, it leads to solve the problems of business management. Thus, managerial economics means the solving business problems through economic analysis.

Scope of Managerial Economics :

Scope of any subject means the area of it's study. Managerial economics has it's roots in economic theory. But it's scope is different from economic theory. Managerial Economics provides management with a strategic planning tool. Thus the perspective of business world would be clarified in regards to it's working. Managerial Economics is mainly concerned with the application of economic principles and theories. The scope of managerial economics covers two areas of decision making.

1) Operational or Internal issues.

2) Environmental or External Issues

Manager of any business firm faces various problems in his daily working. These problems are divided into two types. First kind of problems are related with the internal issues of business firms and another kind of problems are related with environmental issues of the business firms. Hence they are referred as operational or internal issues and environmental or external issues respectively.

1) Operational or Internal Issues :

The manager of business firm faces the problems, which are related to the internal issues of the firm. They are controlled by the manager with the help of economic theories and principles. They are as follow.

i) What to produce ? i.e. Problem of choice of commodity.

ii) How to produce ? i.e. what techniques are to be used ? Either capital intensive or labour intensive techniques.

iii) What capital-labour ratio is to be used ?

iv) What price is to be levied ?

v) How to invest ? And at what quantity ?

vi) How to sale ? At what price ? How to compete ?

vii) How the capital and the profit can be managed in order to make the best use of it ?

Such types of problems are faced by every manager of business firm which are solved with the aid of economics. These problems are related to the economic theories and principles as follows.

1) Demand Analysis : The manager thinks about the demand for his firm's product. A firm can survive, if it is able to cater the demand for its product in market at the proper time and in the right quantity. A firm can economically stand in the market, when it's goods are continuously demanded and sold in the market. Manager looks to the market demand of his firm's product. He mades the accurate estimate of demand and makes the decisions. Before he comes to the final conclusions manger of every business firm can study the basic concepts and theories of demand analysis in economics as law of demand, demand forecasting, elasticity of demand, and their variant factors. It provides the basis for analysing the market influences on his product. Demand analysis also throws light on the factors affecting the demand for the business firm. Thus, demand analysis helps to manager in estimating and manipulating the market demand for his product.

2) Theory of production : Theory of production is also called as the theory of firm. Along with the cost of production it also consists the firm's revenue. It includes the relationship between various factors of production, input-output analysis, capital - labour ratio, optimum production, break even analysis, etc. These economic concepts help to business manager in solving the problems related with the production. .

3) Cost-Analysis : Cost of production is very significant factor in the process of production. Therefore every manager must to possess a good knowledge of cost analysis it includes various kinds of costs, which are very essential in decision making. The various factors responsible for the variation in cost estimates must be given due weightage. These cost estimates are necessary in future planning. There is

uncertainty in regards to cost due to unknown factors. Cost estimates are very essential for most sound profit planning. Hence to find out the firms cost of production the knowledge of cost analysis is very essential for business manager. It includes various costs concepts cost Output analysis, economics of scale, production function, cost control etc.

4) Pricing theories : Managerial economics deals with the pricing theories. Pricing of a product incurs income to the firm. The success of the firm can be comprised in a sound pricing policy of its product, how the price is to be determined in various forms of market such as perfect competition, monopoly, monopolistic competition, oligopoly, duopoly, etc. What conditions are affecting on the pricing process in different markets should be known by the manager of a business firm. Therefore he has to possess the good knowledge of market forms with the help of this knowledge he can form a sound pricing policy. It means that knowledge of pricing theories helps him to formulate good pricing policy and it further assists to decision making.

5) Theory of profit : Profit maximization is a aim of business firm making profit in long run is a sign of successful entrepreneur. Profit depends on various factors such as internal factors and external factors. These factors are many in number e.g. demand for product, input prices, factor prices, competition, economic policy, business risks and the amount of investment etc. Knowledge of sound profit earning policy and techniques of profit planning are also important to business manager. Economic theory provides this knowledge.

6) Resource Allocation : Managerial economics also deals with the problem of optimum allocation of resources. Resources are scare, so they should be allocated efficiently . to different uses by the manager. In order to solve the problem of resource allocation the manager should possess the knowledge of input-output analysis, linear programming etc. With the help of these economic analysis methods manager arrives to the final conclusions in respect of his decision making.

7) Capital-Investment Analysis : Capital is scare and fundamental factor of production. It is foundation of business. Large amount of capital is invested in big firms. So many problems come up before management. In order to solve these problems enough time and labour are required. In brief, the capital budgeting .involves planning and control of capital expenses. This topic consists of cost of

capital, rate of return, selection of project, Cost-benefit analysis etc. The knowledge of Capital Theory helps to take investment decisions.

8) Inventory Management : Every firm requires raw material. It would be stored in inventories. What would be the ideal stock of inventories ? How the stock of inventories should be maintained and controlled ? These are some' of the problems which the manager has to solve. Knowledge of this stock inventory is achieved from economic theory.

9) Advertising : Advertising is the .heart of modern business practices. It is one of the features of modern marketing system. It helps to increase the sale of a product. Therefore every businessman can follow these techniques. How much amount is spent on advertising expenditure ? it increases the cost of production of a commodity as well as sales. The advertising expenditure affects the cost-and sales. More the advertising expenses, more is the cost and the sales and vice versa. Thus economic theory helps to businessmen in solving their problems and to arrive at definite conclusions.

2) Environmental or External Issues :

These issues are related to the general business environment in which the firm or business operates. These are social, economic and political environments, economic environment includes kinds of economic systems, situations existing in the field of production, income, employment, prices, saving and investment, financial institutions as banks, financial corporations, Insurance companies, trends in international trade. It also includes the conditions prevailing in labour and capital markets, government policy, industrial policy, monetary policy etc. Beside this social environment affects the business conditions. It includes trade unions, consumer's co-operatives etc. Political environment is related to state activities. It includes the state's attitude towards business firms. Managerial Economics takes the congnizance of all types of environments affecting the business activity.

These external or environmental issues in managerial economics are related with the Macro-Economics. Thus, the scope of managerial economics reaches in the sphere of micro as well as macro economic theories.

IMPORTANCE OF MANAGERIAL ECONOMICS

Business and industrial enterprenuers aim at earning maximum profits. In order to achieve this objective, a managerial executive has to take care in decision-making, which is the process of selecting a specified course of action from a number of alternatives. Fair knowledge of the aspects of economic theory and the tools of economic analysis is necessary to take a sound decision, which is directly involved in the process of decision-making. Since managerial economics is concerned with such aspects and tools of analysis, it is pertinent to the decision-making process.

The importance of managerial economics in a business and industrial enterprise are as follows

1. Helps to bridge the gap between theory and practical affairs of business : Managerial economics compile tools, techniques, models and theories of traditional economics with actual business practice and with the environment in which a firm has to operate. According to Edwin Mansfield, " Managerial Economics make positive attempts to bridge the gap between purely analytical problems that intrigue many economic theories and the problems of policies that management must face."

2. The estimating of economic relationships : Managerial economics estimates economic relationships between different business factors such as income, elasticity of demand, cost volume, profit analysis etc.

3. Helps to Predicting economic quantities : Managerial economics helps to management in predicting various economic quantities such as cost, profit, demand, capital, production, price etc. Generally the business manager has to function in an environment of uncertainty, it is imperative to anticipate the future working environment in terms of the said quantities.

4. Helps to know external as well as internal forcess : The managerial economists has to identify all the important factors that influence a firm. These factors are broadly divided into two categories. He plays a significant role to help out management in understanding these factors.

*** External factors :** Any kind of firm control is not possible over these factors. The plans, policies and programmes of the firm should be formulated in the light of these factors. Significant external factors impinging on the decision-making process of a firm are economic system of the country, business cycles, fluctuations in

national income and national production, industrial policy of the government , trade and fiscal policy of the government, taxation policy, licensing policy, trends in foreign trade of the country, general industrial relation in the country and so on.

*** Internal factors :** These factors fall under the control of a firm. These factors are associated with business operation and the factors help the management in making sound business decisions.

5. Basis of business policies : Managerial economics is the founding principal of business policies. Business policies are prepared based on studies and findings of managerial economics, which cautions the management against potential upheavals in national as well as international economy. Thus, managerial economics is helpful to the management in its decision-making process.

Managerial Economics does not signify to the study of theoretical economic concepts. Its main concern is to apply theories to find solutions do day-today practical obstacles faced by a firm.

6. Helps in Decision making: It put forth the way for guidance to identify of key variables in decision-making process and aids the business executives to understand the different intricacy of business and managerial obstacles and to take apt decision at the right time. It provides the essential conceptual, technical skills, toolbox of analysis and techniques of thinking and other such most modern tools and instruments like elasticity of demand and supply, cost and revenue, income and expenditure, profit and volume of production etc. to give the solution for the business hindrance.

7. It creates responsive leader : In the context of globalization, privatization, liberalization and mercerization and a highly competitive dynamic economy, it aids in identifying different business and managerial obstacles, their causes and consequence, and suggest different policies and programs to overcome them. It helps the business executives to become much more responsive, realistic and competent to face the ever changing challenges in the modern business world. It helps in the optimum use of limited resources of a firm to make more profits. It also helps in attaining others goals a firm like attaining industry leadership, market share expansion and social responsible etc. It aids a firm in forecasting the most important economic variables like demand, supply , cost, revenue, price, sale and profit etc. and formulate sound business polices.

In conclusion, three major contribution of economic theory to business economics have been enumerated:

* Building of analytical models that help in recognizing the structure of managerial obstacles, eliminate the minor details that can obstruct decision-making, and aid to concentrate on the main obstacles area.

* Making available a set of analytical methods for business analysis thereby, enhancing the capabilities of the business analyst.

* Clarification of the various concepts used in business analysis, enabling the managers avoids conceptual pitfalls.

1.5 Economic Theory and Managerial Theory :

In recent years many new subjects are evolved due to the interaction between basic disciplines. Managerial Economics is a new subject among social sciences. It's roots are found in economic theories. Which are the main theme of Economics. Economics deals with pure economic theories, principles and concepts. The subject Economics is of two types

i) Positive Economics and ii) Normative Economics. Positive Economics deals with the fundamental laws, principles, and theories of economics and on the other hand normative . economics is related with the normative values and applications of economics. Normative values are the ideals or ethical values, which deals with welfare Economics.

Managerial Economics deals with the positive economics for the theory of the consumer and the firm. While it depends upon normative economics to give recognition of what is good or bad from the point of view. of society. Cigarette, liquor manufacturing is dangerous to health, so such warning labels should be printed on the product. In positive economics a manager may ignore the effect of pollution, but in normative economics he has to recognize the special Costs of pollution and to adopt anti pollution measures.

Economics is divided into two parts, i.e. Micro Economics and Macro Economics. Micro Economics deals with the study of a unit of individual behaviour of a economic variables. e.g. Individual consumer, individual firm and other such micro organisations. Managerial economics also studies the individual behaviour of a firm or consumer. It studies several micro economic concepts, like marginal cost,

marginal revenue, elasticity of demand, individual firm, consumer etc. Hence the roots of managerial oeconomics are found in micro economic theories.

Macro Economics deals with the macro behaviour of economic variables. It studies the whole economy. Macro Economics, therefore defined as the study of group or aggregates or averages covering the entire economy. It studies national income, the level of employment, general price level, consumption and investment in economy, foreign trade, money, public-finance, fiscal policy, monetary policy etc. These are all significant factors of economic environment in which the business firm functions. Thus every manager has to possess the knowledge of economic environment. Such knowledge of macro economic theories is helpful to successful managers.

'Baumol' says that there are three main contributions of economic theory to Managerial Economics, i) It helps to managerial economics by building analytical models. These models .are .helpful to solve the problems of managerial economics and also in decision making. 2) economic theory contributes a set of analytical methods. It helps to enhance the analytical capabilities of the business analyst. 3) Economic theory helps to clarify concepts used in business analysis, which helps the managers to avoid conceptual pitfalls.

The Managerial functions involve decision making in various fields and economic, theory which helps it to provide clear understanding of all these problems. Economic theory is useful to the firm in various areas like marketing, sales applications, production and personnel managements, financial management etc.

In the field of marketing, economic theory contributes through the use of applied demand theory. Sales function is related to the analysis of consumer demand. The size of markets depends upon various factors viz. population, advertising, elasticity of demand and supply etc. These concepts are included in demand analysis and market theory.

Economic theory provides these analytical concepts to managerial economics. These concepts are actually applied in managerial economics to derive conclusions. Managerial economics applies these concepts in the field of consumption and production.

Managerial economics uses the concepts of economic theory like economies' of scale, laws of returns, cost concepts etc. to build a sound pricing' policy and pricing decisions.

Economic theory helps to managerial economics in resource allocation to the firm. Financial decisions are taken by the manager of a business firm with the help of economic, theory such as the amount to be invested in new plant or the amount to be spent on advertisement. Managerial economics analyses the nature of financial trade-offs and reveals how the economics helps in resource allocation decisions,

Economics helps to the managers in better decision making process. Economic theories serve as useful tool to solve the problems easily. Also it reduces the time in decision making and chances of making wrong decisions.

The relationship between the Managerial Economics and Economics is very close. Economics formulates the theories and they are applied by managerial economics in real world. Thus Economics provides philosophy to managerial economics in decision making. They are practically used by managerial economics. Therefore 'Spencer and Siegelman', while stating the relationship between these two, say that "Managerial economics is the integration of economic theory with business practice for the purpose of facilitating decision making and forward planning by management."

***Difference between Economics and Managerial Economics**

Economics	**Managerial Economics**
1) *It is a pure Economics.	1) It is applied Economics.
2) It consists of economic theories and principles.	2) Managerial Economics applies economic theories and principles to solve the business problems.
3) Economics has similar emphasis on both Micro and Macro Economics.	3) Managerial Economics relatively give more stress on micro economics than macro economics.
4) 'Micro economics part of Economics considers both Individual consumer as well as firm.	4) It's micro economic part considers only individual firm.
5) It's micro economic analysis deals With rent, Interest, wages and profit.	5) Micro economic part of Managerial Economics is related only with profit.

1.6 Role and Responsibilities of Managerial Economist

Decision making is the main and very important function of the Managerial Economist, His correct and accurate decisions helps to bring prosperity of the business firm. He has to determine the key factors which influence the business of the firm. These factors are of two types, i.e. external factors and internal factors. External factors are national income, foreign trade Government policy etc. which are outside the purview of management. They are determined by the outside environment of the firm. Hence they are not controlled by the manager of a firm. Internal factors are within the limit of firm's management, so they are controlled by the manager e.g. price of his product; rate of .investment, expansion or contraction of his business, production etc.

A manager of a firm has sound knowledge of economic theory and. analytical tools, with the help of these, He executes the policy of a business firm. Policy making is one of his, functions. He should be equipped with specialised skills and modern techniques so that he is able to evaluate the decision making process. He works as decision maker in regards to sales, pricing, financial issues; labour relations, profitability etc. Manager helps in decision making keeping in view the different goals of the firm.

An important role of a manager is to deal with the demand forecasting. He prepares the short period forecasts of his business activity. Every business firm requires two types of : forecasts. Short term fore casts and long term forecasts are up to one year and long term forecasts are upto more than one year forecasts. He has to be every alert to gauge the changes in market conditions. He should evaluate the market potential. He should be adept at market research. Market research provides the information about the market conditions such as present and future market trends. A manager who has detailed knowledge of market conditions helps to plan product improvement, new product policy, pricing and sales promotion strategy.

The next function of managerial economist is to undertake an economic analysis of the industry. It is related with the project evaluation and the project feasibility. So, he should know the cost benefit analysis. With the help of cost-benefit analysis he judges the feasibility of project and comes to the conclusion whether the project is profitable or not with the knowledge of investment appraisal methods. Thus,

economic analysis involves the knowledge of. competition comprised/possibility of internal and foreign sales, the general business conditions etc.

Manager of a firm functions as-advisor i.e. he performs advisory functions. He advises on all matters of production and trade. He works as advisor of the top executives or the policy makers. He advises in all matters both the technical and financial to the top management. Manager of a firm deals with the proper princing strategy. The pricing decision is one of the most significant and difficult, because of non availability of sufficient information. Pricing of established product is different from new products. Government regulation, competitions are prevailing in market, so the manager should be alert and dynamic to take correct pricing decisions.

Analysis of environmental issues is also one of the function of manager in modem times. He has to recognise the social responsibility of the business firm. He has to know the effect of a firm on environmental factors. It's effect should not be adverse on natural environment. All types of pollutions are to be prevented by the productive firm. It is the duty of manager, to be alert about pollution control.

Thus, the role of manager not only deals with decision making but with analyzing, concluding and recommending to the policy maker.

1.6.1 Responsibilities of Managerial Economist :

Manager exercises leadership in the whole group of management personnel. He is responsible for optimum utilization of the scare resources to achieve maximum productivity. His prescriptions for business performance under entertainments of future are important for forward planning.

Managerial Economists suggestions in respect of costs are very important for the growth and survival of the firm.

Managerial Economists is responsible to the business firm in regards to the social responsibilities. He should have to consider various sociological issues, viz. Pollution control, price fixation, profit etc. Decisions taken in respect of these issues do not result into exploitation of the common people.

In order to become a more practical man, managerial economist should also possess the knowledge of other disciplines. Therefore external factors affecting the existence and the working of the business firm should not be restricted. These

external factors are Government policies, foreign trade conditions, trade cycles, labour situation in the country, various economic legislation etc.

Lastly, management is greatly helped by the managerial economist by his significant role in decision making and forward planning, he must look at his responsibilities and obligations discharges them effectively. Thus, Managerial Economist have to perform the above responsibilities in order to achieve the higher growth and better future of the business firm.

1.6.2 Managerial Economics and Decision making :

Decision-making and forward planning are two very important functions of the managerial economist. He makes the correct decisions, prepare future plans and implements them to .earn expected profit.

Decision making is essentially a process of selecting the best out of alternative opportunities open to the firm. Every manager of a business firm has to face the various kinds of business problems. They are simple or complex in nature. So the most important function of the managerial economist is the-decision making and forward planning of a. business firm. According 'Louis A. Alien'.

"Decision making is the work which a manager performs to arrive at conclusion and judgment." It means that before taking the decision the manager examines the relationship' between various factors and then come to the conclusion. This act is referred as decision making. .

'George Terry' defined it as, "Decision making is the. selection based on some criteria from two or more possible alternatives."

'D. E. Macfarland' calls it as, "A decision is an act of choice wherein an executive forms a conclusion about what must be done in a given situation. A decision represents behaviour chosen from a number of possible alternatives."

'Herbert Simon' opines that "Decision making comprises, three principles phases finding occasions for making decisions, finding possible courses of action and choosing among courses of action."

All above definitions clarify the meaning of decision making. Decision making comprises the points viz.

1) Decision making is a process of. selecting the best alternative out of available alternatives.

2) It is an intellectual work, which manager has to perform before arriving .at any conclusion.

3) It is an act of choosing from different alternatives.

Thus, process of decision making consists of four phases. They are as follows.

1) Determining and defining the objective.

2) Collection of information in respect of social, political and technological environment and forecasting on them.

3) Inventing, developing and analysing possible courses of action.

4) Selecting a particular course of action, from available alternatives.

In the process of decision making the management of a company can apply the theories and tools of economic analysis. Economic theories express the functional relationship between two or more economic variables, under certain given conditions. Application of the economic theories to the problems of business influences decision making process in three ways.

1) It offers clarity of various economic concepts viz. demand, price, cost of production, externalities etc.

2) It helps in ascertaining the relevant variables and specially reveals the relevant data.

3) Economics expresses the relationship between various economic variables arid provides consistency in analysis. It helps in drawing the accurate conclusions. Thus applications of economic theories to the problems of business firms guides, assists and streamlines the decision making process, as well as it contributes to the valid decisions.

Economics helps to the business manager in various ways. By the application of economic theories and principles manager of a firm solves the various problems in business sector. Internal problems are solved with the help of micro-economic analysis like demand, production, costs, price, profit, investment, resource allocation etc. Also the external problems are solved with the helps of macro economic theories

like, national income, fiscal policy, economic policy, monetary policy, employment, business-cycles, international trade, inflation, deflation etc.

By using the micro and macro economic theories managerial economist arrives at final conclusions and business decisions are taken. Thus economic theories helps to manager to analyse the problems, to derive the conclusions, to take the decisions, and to solve the business problems. Thus decision making and forwards planning is prime functions of managerial economist.

1.7 Objective of business Firm

Traditionally, the business firm is known as economic unit. So profit maximization is a main objective of business firm. This view was later on, replaced by stating that besides profit maximization object sales maximization, revenue maximization, growth maximization etc.' are .the other objectives to be achieved.

According to Prof. Boulding, Bamou!, Higgins, scitovski, melwin Reader, perter Drucker, 'Joel Dean etc. Profit maximization is not only a sole objective of business firm but other objectives are also important which are performed by the firm.

Following are the main objective's of business firm.

1.7.1 Profit - Maximization :

The traditional goal of .a business firm is profit maximization. It means that to achieve more and more amount of profit over a period of time in short and long run. Price of product of business firm is determined in market by demand and supply conditions. Price is determined at the point of equilibrium, where demand equals supply of a product. Business firm has to maximize it's profit at this market price. In perfect competition firm is price taker and in imperfect competition it is price searcher. Because in imperfect competition the number of sellers is small so each seller has control over it's selling price.

Profit's is the difference between total Revenue and total cost. It can be calculated by deducting the total cost from total revenue.

Profit = Total Revenue - Total cost.

In order to maximize the profit there are two conditions which must be fulfilled in any form of market.

1) Marginal cost must be equal to marginal Revenue, i.e. MC = MR

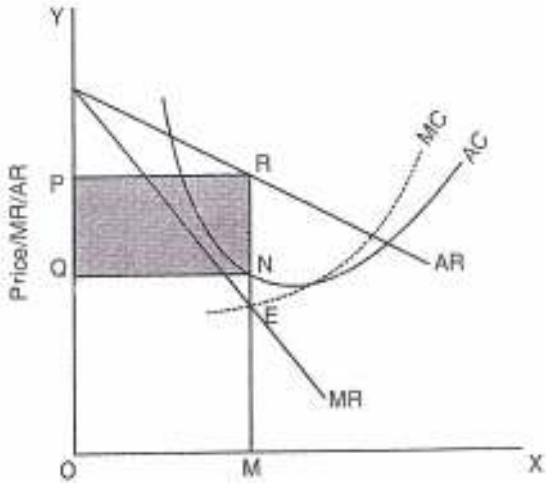
This condition is called the necessary condition.

2) Marginal cost curve must intersect Marginal revenue from below.

i.e. MCMR.

This is secondary condition, or sufficient condition.

Where these two conditions are to be fulfilled, the firm achieves maximum profit at this point. This marginal conditions of profit maximization is illustrated as below.



Output

Fig. 1.1

In the figure 1.1 AR and MR are the Average and Marginal revenue curves slopping downwards to the right. AR curve lies above the MR curves. Such situation prevails in monopoly market. AC is average cost curve, it is U-Shaped. MC is marginal cost curve. It is rising from left to right upwards.

MC curve Intersects MR curve form below at point E. Hence E is the equilibrium point. At the point E both conditions MC = MR and MC curve intersects MR curve form below are fuelled. Up to the OM level of output MR is greater than MC. Therefore monopolist will be in equilibrium at the point E. He produces OM level of output and determines OP price.

By selling OM output at OP price he will achieve profit equal to rectangular PQNR.

Profit	=	Total Revenge	Total Cost
	=	Total output x Average cost.	Total output x Average Revenue
	=	OM x OP	OM x MM
	=	OPRM	OQNM
	=	PQRN	

Hence momopolistic firm can achieve and maximise profit equal to a PQNR.

1.7.2 Sales - Revenue Maximization

It is an another objective of the business firm. According to 'Baumot Sale revenue maximization is an alternative objective to profit maximization. Every firm prefers maximization of sales revenue for various reasons as. .

1) Managers salary and other earnings are more closely related to sales and revenue. It results into healthy personnel policy.
2) Banks and other financial institutions look at sales revenue of a firm while financing to it.
3) Sales-revenue trend is an indicator of performance of a firm.
4) Rise in sales-revenue of a firm is prestigious to manager of a business firm, but profit goes to others.
5) Manager of the firm finds profit maximization a difficult objective to fulfill consistently over a period of time with same level.
6) Growing sales strengthen competitive spirit of the firm in the market.

Baumol's sales-revenue maximization model is based upon the following assumptions.

1) Sales maximisation object is subject to minimum profit. It means that when firm achieves sales-revenue maximisation, it has to leave profit maximization goal.
2) To maximise sales, advertisement plays very important role. It causes to increase the demand for product of business firm.
3) Advertisement costs are not included in costs of production.

4) Price of the product remains to be constant.

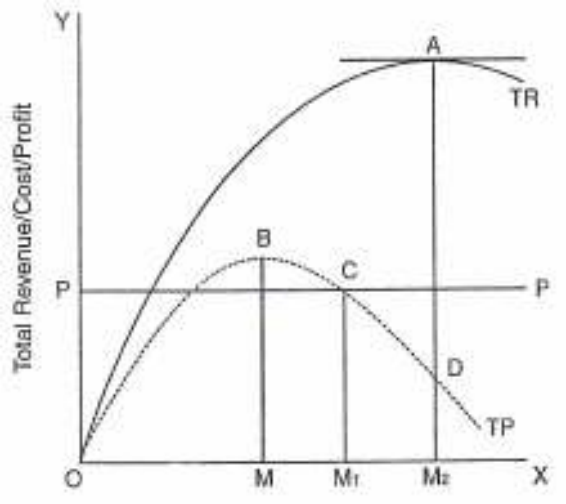


Fig. 1.2 : Output

In the figure 1.2 output is taken on x-axis and Total revenue, total cost and profit is taken on Y axis. PP is minimum profit line drawn parallel to X-axis. TR and TC are the total revenue and total cost curves respectively. Tp is total profit curve, it rises up to the point B and then falls. Total Revenue curve is also rising from left to right and further it becomes parallel to X-axis in the point A and then it is declining. The Point A on TR curve is shown by a tangent line. It reveals that in the point A TR curve becomes parallel .to X axis. There fore in the point A marginal revenue becomes zero (0). At the level of output at the point A sales revenue of a firm becomes maximum. It reveals OM_2 level of output. .

The point B on TP curve is the apex point. Which shows the maximum profit; It shows the OM level of output.

If firm has to achieve the maximum profit goal, it has to produce OM level of output. But profit maximization is not a goal of business firm but instead of it sales revenue maximization is the goal of a firm. So it attempts to sale OM_2, level of output and gets M_2D profit.

But M_2D profit is lower than minimum level of profit 'PP' or M1C previously determined by the manager. So the firm can't accept to sale OM level of output. While falling the TP curve it intersects minimum profit line PP in the point C and at

the output level OM,. Hence firm can accept to sale OM, level of output which is more than profit maximization output. So firm will produce OM_1 output. This theory shows that manager of business firm may consider non price competition through sales maximination.

1.7.3 Other Objectives :

Business manager may also consider other economic objectives besides profit and sales revenue maximization goals. They are as follows.

1) Maximization of growth Rate :

'Morris' an eminent economist has suggested this objective' of maximization of growth rate of the firm. It means that maximization of demand for firm's product. Morris says that by maximising these variables, manager of a business firm maximise their own utility function as well as that of the owners. Manager's utility function includes factors like salaries, status, job security, power etc. Profit, capital, market share etc. factors' are included in owners utility function. All of these factors are positively co-related with a single variable, i.e. size of the firm. Maximization of these variables depends upon the maximization of the growth rate of the firm. Therefore manager tries to seek the rapid and steady growth rate of the firm.

Thus, this is a dynamic objective -of a firm, with which a firm can attain maximum rate of growth with optimum profit.

2) Desire for Liquidity :

According to 'Prof. Joel Dean' the liquidity criterion is also more important. It means that a firm is willing to keep adequate amount of cash to avoid liquidity problem. The fear of financial problems and bankruptcy are very important and powerful factors in influencing the firm to hold adequate cash. Thus, desire to keep adequate cash with itself is. an one of the economic objectives of a firm.

3) Survival in Long-run :

'Rothschild' suggested this objective of a firm that survival in long-run period. He says that survival in long run period is an objective of a firm 'Peter F. Drucker' has also supported this view. This is a long term goal and it requires profitability. Profit should not be maximum but it is reasonable profit. Firm can survive in long period only if it will achieve good will of the people by producing best quality of it's

products. A good will earned would help the firm to enjoy a bigger share of the market and this will enable it to survive in long period.

4) Building up public confidence for the product :

This is the secondary goal of survival of the business firm. Therefore firm may build lip the customers confidence in respect of his produce, firms are applying advertising techniques, to build up the public confidence for it's products.

5) Entry-prevention and risk avoidance :

Some writers suggested that entry prevention of new firms is also one of the objective of the firm. Every firm attempts to prevent the entry of new firms in industry. It is so that to achieve the profit maximization goal in long run to stay in market constantly and to avoid the risks emerges due to the uncertain behaviour of new firms.

6) Sound business practice :

Some economists says that business firms also give 'more. importance to business ethics, They adopt fair and sound business practices viz. providing price lists, replacement of defective product to build up good will. etc.

1.8 Techniques or Methods of Managerial Economics

Managerial economics is essentially applied economics in the field of business management. It is economics of business or managerial decisions. It pertains to all economic aspects of managerial decision making. It is an evolutionary science; it is a journey with continuing understanding and application of economic concepts, principles, theories, models, and categories in dealing with emerging business situations and problems in a dynamic economy.

Techniques or Methods of Marginal Economics:

Following are the most important methods which are used by managerial economics to explain and solve business problems of a firm:

1. Scientific Method: Scientific method is a branch of study which is concerned with observed facts systematically classified and which includes trustworthy method for the discovery of truths. It refers to a procedure or mode of investigation by which scientific and systematic knowledge is acquired. The method of enquiry is a very important aspect of science, perhaps this is the most significant

feature. Scientific method alone can bring about confidence in the validity of conclusions. It concentrates on controlled experi-ments and investigates the behaviour of preconceived elements in a highly simplified environment. This method is of limited use because it is difficult to carry out experiments to test the validity of managerial behaviour, as it deals with human aspects and behaviour which is complex.

2. **Experimental method**: The experimental method may be usefully applied to those aspects of managerial behaviour which call for accurate and logical thinking. The experimental methods are of limited use to managerial economics. A managerial economist cannot apply experimental methods to the same extent and in the same way as a physicist can in physical sciences.

3. **Inductive and Deductive Method:** Managers usually adopt an inductive as well as deductive approach in any analysis of managerial behaviour. The deductive method begins with postulates and hypotheses which are arbitrary. For the rational-ists, there stands at the head of the system, a set of self-evident propositions and it is from these that other propositions are derived by the process of reasoning. At the other end are empiricists who believe that science must construct its axioms from the same data and particularly by ascending continually and gradually till it finally arrives at the most general axioms. Both the methods are interdependent and hold an equally important place in any scientific analysis.

4. The Statistical Method: Statistical methods are a mechanical process especially designed to facilitate the condensation and analysis of the large body of quantitative data. The aim of statistical method is to facilitate comparison, study relationships between the two phenomena and to interpret the complicated data for the purpose of analysis. Many a time comparison has to be made between the changes and results which are due to changes in time, frequency of occurrence, and many other factors.

Statistical methods are used for such comparison among past, present and future estimates. For example, such methods as extrapolation can be applied for the purpose of making future forecast about the trends of say, demand and supply of a particular commodity. The statistical method of drawing inference is mathematical in nature. It not only establishes causal relationship between two or more variables but also tries to establish a mathematical relation-ship between them. Statistical approach is a

quantitative micro-approach. Certain important correlation and association of attributes can be found with the help of statistics. It is useful for the study of manage-ment, economics, etc. and it is very helpful to bankers, state, planners, speculators, researchers, etc.

Though statistical methods are the handmaid of managerial economics, they should be used with care. The most significant peculiarity of the statistical method is that it helps us to seek regularities or patterns in economic data and permits us to arrive at generalizations that cannot be reached by any other method.

5. Method of Intellectual Experiment: The fundamental problem in managerial economics is to find out the nature of any relationship between different variables such as cost, price and output. The real world is also invariably complex. It is influenced by many factors such as physical, social, temperamental and psychological. It is difficult to locate any order, sequence or law in such a confused and complex structure. In this context, it is essential for the managerial economist to engage in model building. Managerial economics may be viewed as economics applied to problem solving at the level of the firm. The problems relate to choices and allocation of resources is faced by managers all the time. Managerial economics is more concrete and situational and mainly concerned with purposefully managed process of allocation. For this purpose the managerial economist can and does use an abstract model of the enterprise. Firms have only limited resources at their disposal which they must utilise to make profit. The managers of these firms must make judgements about the disposition of their resources and decide which priori-ties among the various competing claims they have upon them. Models can guide business executives to predict the future consequences.

6. The Method of Simulation: It is an extension of the intellectual experiment. This method has gained popularity with the devel-opment of electronic computers, calculators and other similar equipment and internet services. We can programme a complex system of relationship with the help of this method. Computer is not only used for scientific or mathematical applications, it may also be used for some business applications, docu-ment generations and graphical solutions. Computer is a fast electronic calculating machine capable of absorbing, processing, integrating, relating and producing the resultant output information within a short span of time. A manager has to take numerous decisions in the management of business which may be minor or major, simple or complex. They have to ensure that

once the decision is taken, it is to be implemented within the minimum time and cost. The electronic gadgets will enable the manager to understand busi-ness problems in a better perspective and increase his ability to solve the business problems facing him in the management of business.

7. The Historical Method: Past knowledge is considered to be a pre-requisite for present knowledge. This is the main argu-ment for the adoption of historical method in the present day managerial economics. In order to discover some basis for business activity, the method becomes generic in character. The main objective of this method is to apply mind in the matter of various business problems by discovering the past trend regard-ing facts, events and attitudes and by demarcating the lines of development of thought and action. If we have an idea of the past events, we can understand the current economic problems much better. The wisdom of a particular economic policy is an inevitable product of its past. The historical method requires experience not only in collecting data but also in finding out their relations and significance in the particular context. The managerial economist must take up the analyti-cal view in order to get perfect control over facts and the synthetic view of facts. He should be able to find out the relations between events and events and between events and environment. It is necessary to make an objective approach both in discovering facts and interpreting them. But in order to be objec-tive, the approach must be based on relevant, adequate and reliable data. For applying historical method, the managerial economist should be familiar with the general field of his topic and be clear with regard to his own objective. A good deal of imagination is required to apply the historical method.

8. The Descriptive Method: The descriptive method is simple and easily applicable to various business problems, particularly in developing countries. It is a fact finding approach related mainly to the present and abstract generalisations through the cross sectional study of the present situation. This method is mainly concerned with the collection of data. To some extent, the descriptive method is also concerned with the interpretation of data. In order to apply the descriptive method, the data should be accurate and objective and if possible quantifiable. Since the descriptive method wants to relate causality of the collected facts, it is necessary for it to make comparisons between one situation with the other and among different aspects of the same situation. Thus, situational comparability is an essential element of this method. This method is used to describe the organisation and functioning of

institutions and the policies which have economic significance. To analyse the impact of the organisational structure in the working of business enterprises, it is widely used by the managerial economist. The best descriptive studies are observational in nature. This method provides the empirical and logical basis for drawing conclusions and gaining knowledge. Thus it enables the managerial economists to describe or present the picture of a phenomenon or phenomena under investigation.

1.9 Summary

Managerial economics is a new branch of economics. It is founded by 'Joel Dean' in 1951. It is also called 'Business Economics', 'Applied Economics'. Economic theories and principles are applied to the daily business. It contains the application of economics, principles, theories and concepts of actual business. Various economists defined it by various angles. It's meanings is similar. It's scope contains micro as well as macro economic principles.

Economics theories are applied by business manager to actual business in daily life. The association between econmic theory and managerial theory is explained. Managerial theories are dependent upon economic theories. So, Business manager plays an important role in the application of economic theories to daily business. So, he has very important role and responsibilities in running daily bsuiness decision making.

There are various objectives of business firm viz. 1) Profit maximization, 2) Sales revenue maximization and 3) Other objectives.

1.10 Questions For Self Study

A) Fill in the blanks.

1. Managerial Economics if founded by .....
2. Managerial Economics is also called as .....
3. Managerial Economics contains ..... and .....
4. ..... is the main function of Managerial Economics.
5. ..... is a traditional objective of Business firm.

A) Ans.: 1) Joel Dean

2) Applied Economics / Business Economics

3) Micro and Macro Economics

4) Decision Making

5) Profit Maximization

AA) Fill in the Blanks

1. ———————— method alone can bring about confidence in the validity of conclusions.

   a) Scientific b) Descriptive c) Historical d) Simulation

2. ————— is mainly concerned with the collection of data and to some extent; it is also concerned with the interpretation of data.

   a) Scientific method b) Descriptive method

   c) Historical method d) Simulation method

3. The ———————— is an extension of the intellectual experiment.

   a) Scientific method b) Descriptive method

   c) Historical method d) Method of Simulation

4. ————— method has gained popularity with the devel-opment of electronic computers, calculators and other similar equipment and internet services.

   a) Scientific b) Descriptive c) Historical d) Simulation

5. The ————— begins with postulates and hypotheses which are arbitrary.

   a) Deductive Method b) Inductive Method

   c) Descriptive method d) All the above

AA) Answers for Self Learning Questions

1. a) Scientific 2. b) Descriptive method 3. d) Method of Simulation

4. d) Simulation 5. a) Deductive Method

B) State True and False.

1. Managerial Economics is the integration of economic theories with business practice.

2. Managerial Economics helps to business manager in decision making.
3. Sales-Revenue maximization objective of business firm is given by Joel Dean.
4. MC = MR is the main condition for profit maximization.
5. Managerial Economics is only related with macro economics.

Ans. : 1) True 2) True 3) False 4) True 5) False

1.11 Questions for Practice

1. Define Managerial Economics, State its scope & importance
2. Explain role and responsibilities of business manager.
3. Explain profit maximization objective of business firm.
4. State Baumol's objective of business firm.
5. Explain the different techniques of Managerial Economics.
5. Short Notes :
   (i) Features of Managerial Economics
   (ii) Managerial Economics and Decision Making
   (iii) Role and Responsibilities of Business Manager
   (iv) Other Objectives of Business Firm.
   (v) Methods of Managerial Economics

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❑❑❑

Unit-2

Demand Analysis and Consumer Behaviour

Index :

2.0 Objectives

1. To study demand function.
2. To study Law of Demand.
3. To study Elasticity of Demand
4. To study Indifference Curve Analysis.
5. To Study Revealed Preference Theory.
6. To Study various theories of consumer's choice under risks
7. To Study demand forecasting.

2.1 Introduction

The meaning of the term demand is commonly taken as the desire for a thing. In 'economics meaning of the word demand is different from the commonly used. In economics the word demand is always backed by the enough money to purchase a thing in market. Therefore the word demand is defined as below.

According to 'Stonier and Hague', "Demand in economics means to pay for the goods "demanded" It means .a consumer is willing to purchase a commodity and who is having sufficient money, thus the will to purchase a commodity is

transformed into demand. Purchasing power therefore plays important part in creation of demand.

'Benham' has defined it as "the demand for anything at a given price is .the amount of it which will be bought per unit of time at the price."

This definition stresses on three aspects of demand viz. price, quantity demanded and time. Thus demand comprises the elements as purchasing power, price, quantity and time.

2.2 Demand-Function

Demand Function shows the relationship between demand for a commodity and factors affecting it. It states the functional relationship between the demand for a commodity and it's determining factors. These factors are as follows price of a commodity income, prices of substitutes and complementary goods, tastes and preferences of people, fashions, population etc. Therefore, the functional relationship between these determinant factors and demand for a commodity is called as demand function. It is mathematically shown as follow.

D = f (a, b,c,d, e....,...n)

Where,

D = Demand for commodity

f = Function

a = price of commodity

b = Income of people

c = price of substitutes and complementaries

d = population

e = Tastes and preferences of people

n = n^{th} or last factor affecting the demand

2.3 Law of Demand

'Alfred Marshall' stated the law of demand as "other things being constant, if. price of a commodity increases it's demand decreases and if price decreases it's demand increases."

This law shows the inverse relationship between the two variables demand and price of a commodity. Other things means the income, prices of substitutes and complementaries, tastes and preferences of people, population etc. When all of these other factors remain constant, the Law of demand founds to be true.

The law of demand is explained with the help of a demand schedule. The demand schedule shows the quantities demanded at different levels of prices.

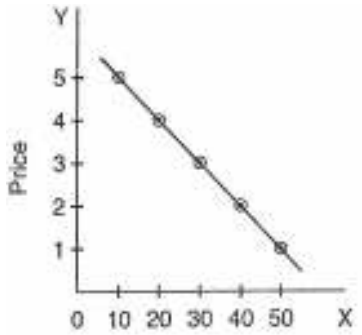
2.3.1 Demand Schedule :

Demand Schedule of a individual consumer reveals that when price falls as Rs. 5 to 4, 3, 2,1 the quantity demanded will increase as 10, 20, 30, 40 to 50 units respectively. It shows the inverse relationship between price and demand of a commodity.

Demand Schedule 2.1

Price (Rs.)	Demand (units)
5	10
4	20
3	30
2	40
1	50

With the help of demand schedule, we can draw the demand curve as follows.



Demand

Fig. 2.1

By taking the quantity demanded on x-axis and price on Y-axis. DD demand curve is drawn. It falls from left to right and shows the inverse relationship between price and demand of a commodity. Thus demand curve is downward slopping curve or falls from left to right downwards.

2.3.2 Market Demand Curve

Market demand is a sum of the individual demand for a commodity in market. Different consumers purchase different quantity at various prices. So all the consumers demand for a particular price is to be summed up and market demand is computed at different prices. It provides that total market demand schedule.

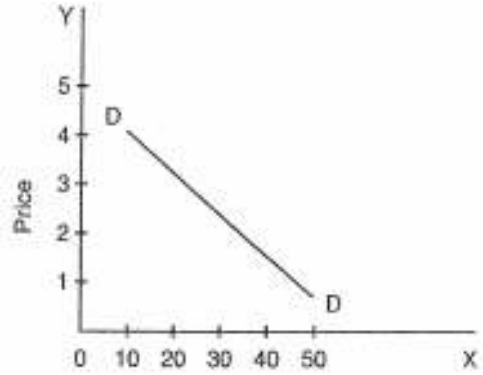
T - 2.2

Price (Rs.)	A's Demand	B's Demand	Market Demand
5	20	10	30
4	25	15	40
3	10	20	50

This table 2.2 shows that there are two consumers A and B in the market.

Quantities demanded by A and B consumers are as 20 + 10, 25 + 15, and 30 + 20 at the prices 5, 4 and 3-Rs. respectively. It shows the total market demand as 30, 40 and 50 units respectively at the above prices.

If this price-quantity demand relationship is plotted on a graph. We get the downward slopping demand curve. Which shows the inverse relationship between the price and quantity demanded of a commodity. As shown in following fig. 2.2.



Demand

Fig. 2.2

Assumptions :

The Law of demand is based on following assumptions.

1. Consumer's tastes and preferences remain constant, i.e. There is no change in it.
2. Income remains constant.
3. Prices of substitutes and complementaries remain constant.
4. No substitute is available to the commodity.
5. Population remains constant.

2.3.3 Limitations :

All above assumptions are the limitations to the Law of demand. They are as follow.

1. **Change in Income :** If there is change, in. consumer's income, Law of demand doesn't operate.
2. **Change in Tastes and Preferences :** If the tastes and preferences of people may go on change, the law of demand could not be found true.
3. **Change in prices of other goods :** If prices of other goods i.e. substitutes and complementaries are changed, the law of demand doesn't show the inverse relationship between price and demand for a commodity.
4. **Population change** : If Population changes the law of demand does not found true.
5. **Availability of close substitutes :** If there is existence of close substitutes to consumer's goods, the law of demand doesn't fulfill the inverse relationship between price and demand.

2.3.4 Exceptions :

There are few exceptions to the law of demand. In some particular situations it will not be existed. Hence these situations are called exceptions, they are as below

1. **War :** War period is exception to the law of demand. In this period scarcity of various goods is prevailing in the country. So people are purchasing goods more at higher prices also. It means that during the war period even though commodity prices remain high, people can demand more and more goods.
2. **Economic Depression :** The period of economic depression is also another exception to the law of demand. During this period commodity prices are

existing at it's lowest level, till people do not demanding it in a large quantity. It means that, during the period of economic depression price and demand both are remaining lower. Hence law of demand doesn't be operated.

3. **Status symbol commodities :** Precious commodities like diamonds, precious stones, old and scare pictures, idols etc. are the status symbols and it is always purchased by the rich people to confer social distinction. These commodities are .not purchased for their intrinsic value but for the prestige they confer upon the possessor. Therefore as the price of these goods falls, demand also falls and vice versa.

4. **Giffen goods :** Giffen goods are the low priced or inferior goods. They are exception to the law of demand. A fall in its price tends to reduce it's demand and rise in price causes to increase the demand. This relationship was searched by Sir Robert Giffen. Hence, it is named as Giffen goods.

5. **Essential goods :** The goods which are necessary to life of human beings. A consumer doesn't reduce it's daily consumption as it's price, rises or doesn't increase it's consumption as price falls. e.g. A family required 10 kg of rice per month, as price of rice rises family chief doesn't reduce it's consumption below 10 kg. If he does so, starvation would occur in his family. On the other hand price of rice falls, he can't consume 50 kg. of rice per month instead of 10 kg. Thus, the nature of life necessary goods is such that it's consumption can not be changed as price changes.

2.4 Elasticity of Demand

Elasticity of demand refers to the rate of change of demand to the rate of change in price. Law of demand only expresses the inverse relationship between price and demand of a commodity. But it doesn't say about the proportionate change in demand to the proportionate change in price. Therefore the concept of elasticity of demand is developed, by 'Alfred Marshall'. Elasticity of demand is defined as "It is the ratio, of proportionate change in quantity demanded to the proportionate change in price of a commodity." It means that elasticity of demand shows the ratio of percentage change in demand to the percentage change in price. Thus, the elasticity of demand expresses the degree of correlation between demand and price. It is the rate at which quantity demanded varies with a change in price.

With the help of this definition elasticity of demand is expressed in mathematical term as :

$$e = \frac{\Delta q}{q} \div \frac{\Delta p}{p}$$

Where, e = Elasticity of demand.

q = Initial demand

Δq = Change in demand

p = Initial price

Δp = Change in price.

e.g. Let us assume that price of a commodity is decreased, from Rs. 10 to Rs. 5 so that demand increased form 10 to 20 units. Therefore elasticity of demand is calculated as :

$$e = \frac{\Delta q}{q} \div \frac{\Delta p}{p} = \frac{10}{10} \div \frac{5}{10}$$

$$= \frac{10}{10} \div \frac{5}{10}$$

$$= \frac{10}{5}$$

= 2 Therefore elasticity of demand is equal to 2.

Elastic and inelastic Demand :

When the small change in price causes large change in demand, it is called as elastic demand, e.g. Suppose rise in price by 2%, causes fall in demand by 10% it results into elastic demand. In regards to this elasticity of demand is calculated as e = Δq / Δp= 10/2 = 5. When the elasticity of demand is greater than, 1, (e > 1).

This type of change in demand is called elastic demand.

Inelastic demand : When a big change in price causes a small change in demand, it is referred as inelastic demand, e.g. If price falls by 5% and demand rises by 4%. It results into inelastic demand, e = Δq / Δp = 4/5 =0.80%. The elasticity of demand is less than 1. (e < 1).

Hence, elasticity of demand is inelastic.

2.5 Types of Elasticity of Demand

There are three types of elasticity of demand.

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

1) Price elasticity of demand : The concept of price elasticity of demand is concerned with the change in price to the change in demand. It shows the effect of change in price to the change in demand. "Marshall' was the first economist, who defined the price elasticity of demand as the ratio of percentage change in quantity demanded in response to a percentage change in price." Mathematically it is shown as :

$$\text{Price elasticity of demand} = \frac{\text{proportionate change in quantity demand}}{\text{Proportionate change in price}}$$

$$e = \frac{\Delta q}{q} \div \frac{\Delta p}{p} \qquad \therefore \quad \frac{\Delta q}{q} \div \frac{\Delta p}{p}$$

Where, e = Price elasticity of demand

Δq = Change in quantity demanded

q = Original quantity demanded

Δp = Change in price

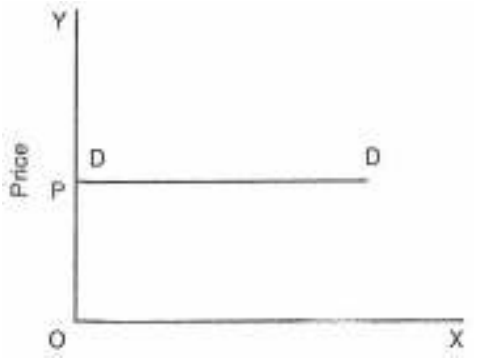
p = Original price.

There are five cases of elasticity of demand

1) Perfectly elastic or infinite elasticity demand
2) Perfectly Inelastic demand
3) Relatively Elastic demand
4) Relatively Inelastic demand
5) Unit Elastic demand

1) Perfectly Elastic or Infinite elastic demand :

When a small change in price leads to very large amount of change in demand, it is called as perfectly or infinitely elastic demand. It is diagrammatically represented as follow.



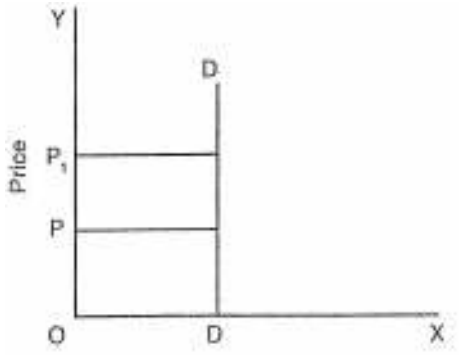
Demand

Fig. 2.3 :

DD is horizontal straight line demand curve. It shows that small fall in price leads to an unlimited increase in demand. It is hyper sensitive demands and elasticity of demand is infinite.

2) Perfectly inelastic demand :

When any change in price doesn't cause any change in quantity demanded, i.e. any change in price, it may be large or small doesn't cause any amount of change in demand. In this case demand remains constant to change in price. So it is called perfectly inelastic demand. It is diagrammatically shown as below.



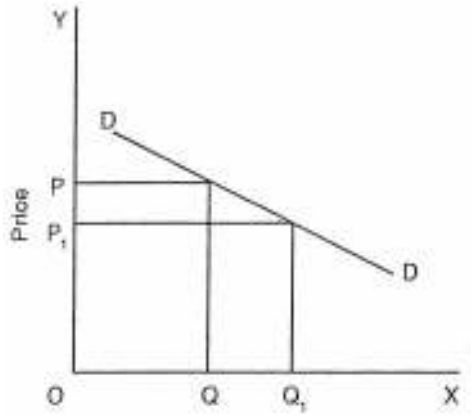
Demand

Fig. 2.4

DD is demand curve. It is vertical straight line curve parallel to Y axis. It shows there is no change in quantity demanded as price changes. Price changes from OP to OP1, but demand remains OD i.e. same.

3) Relatively Elastic demand (e > 1) :

When change in price is followed by big change in demand, it is called elastic demand. In other words, when the change in quantity demanded is greater that change in price is called relatively elastic demand. !n this case elasticity of demand is greater, than 1. (e > -1). It is diagrammatically shown as follow.



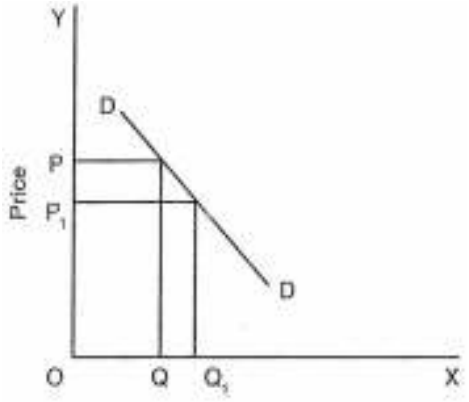
Demand

Fig. 2.5

In the figure, change in price PP_1 is smaller than the change in demand QQ_1. Therefore, DD demand carve is flatter.

4. Relatively Inelastic demand (e < 1) :

When change in demand is smaller than change in price, it is referred as relatively inelastic demand i.e. Large change in price leads to smaller change ,in quantity demanded. Diagrammatically it is shown as follow.



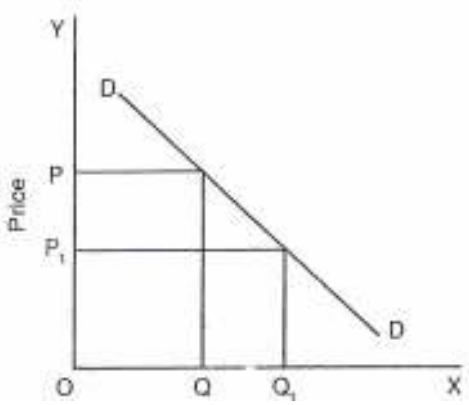
Demand

Fig. 2.6

DD is downward slopping demand curve. It shows that change in price PP, is greater than change in quantity demanded QQ, Hence, the demand is inelastic.

5) Unit Elasticity of demand (e = 1)

When the change in price is exactly equal to the change in demand, it is referred as unitary elastic demand. Here, demand changes in equal proportion of change in price. Therefore elasticity of demand is equal to 1. It is diagramatically shown as below.



Demand

Fig. 2.7

DD is downward slopping demand curve. It shows that change in price PP, is exactly equal to the change in quantity demanded QQ1.

Therefore price elasticity of demand is equal to 1, or it is called the unitary elastic demand.

2.6 Measurement of Elasticity of Demand :

There are three methods of measurement of elasticity of demand, viz.

1) Total Outlay Method 2) Proportional Method 3) Geometrical Method

2.6.1 Total Outlay Method or Total Expenditure Method :

In this method change in total expenditure on a commodity resulted due to the price change is compared and elasticity is measured. These changes are compared in three ways as below.

1. When 'change in .price (rise or fall), doesn't lead to change in the total outlay on a commodity, it means that if price changes but total outlay-on a commodity doesn't-change or remains the same. It is referred as unitary elastic demand, or e = 1.
2. In this case, price rise is followed by decrease in total outlay or fall in price is resulted into rise in total outlay on a commodity. It is called as elastic demand In this case elasticity of demand is greater than 1 ,(e > 1)
3. If price rises, total outlay also rises or price falls, total outlay also falls/This type of elasticity is called as inelastic demand. Also it is referred as price elasticity

of demand is less than one (e < 1).

This method is explained with the help of following table 2.3.

T - 2.3

Price (Rs.)	Demand (unit)	Total Outlay (Rs.)	Elasticity of Demand
10	5	50	
5	10	50	e = 1
10	5	50	
5	20	100	e > 1
10	5	50	
5	7	35	e < 1

2.6.2 Proportional Method :

In this method the percentage change in price is compared with the percentage change in demand. The elasticity of demand is calculated with the help of formula as given below.

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

e.g. $e = \frac{\Delta q}{q} \div \frac{\Delta p}{p}$

1. Suppose, price of a commodity is decreased by 10% and it caused to rise in demand by 20%. The elasticity of demand is equal to $e = \Delta q/\Delta p = 20/10 = 2$. Therefore elasticity of demand is greater than 1 i.e. $2 > 1$, hence demand is elastic.
2. If price is decreased by 10% and demand is increased by 5%. In this case the elasticity of demand is $e = \Delta q/\Delta p = 5/10 = 1/2$ i.e. 0.5. The elasticity of demand is less than 1. Hence demand is inelastic.
3. When price falls by 10% and demand increases by 10%. Here the elasticity of demand is $e = \Delta q/\Delta p = 10/10 = 1$. The elasticity of demand is equal to 1, i.e. 1 =1. Hence the demand is unitary elastic.

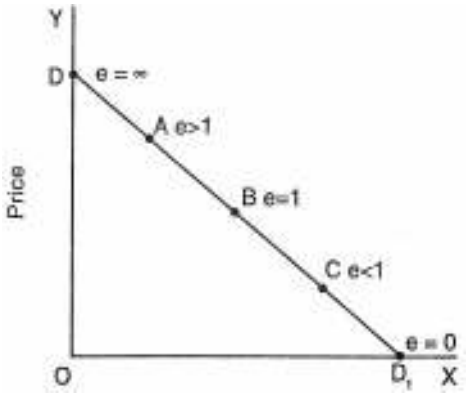
2.6.3 Geometrical Method : (Point Elasticity) :

In this method the elasticity of demand is measured at any point on demand curve. When the demand curve is a straight line demand curve. In order to measure elasticity of demand at any point on a demand curve, the formula used is as below.

Elasticity of demand at any point on demand curve is the ratio of lower part of the demand curve to the upper of the demand curve, from that point, where elasticity of demand is to be measured.

$$\text{Price Elasticity of demand} = \frac{\text{Lower Segment of the demand curve from that point}}{\text{Upper segment of the demand curve from that point}}$$

DD_1 is a straight line demand curve. It's length is 4". A, B, C, are points lying on that curve. B is a mid point, which divides DD curve equally into two parts. So BD = BD, = 2'. A point lies at the mid point of segment BD. Therefore BA = AD = 1'. Similarly C Point lies at the mid point of segment BD. so BC = CD = 1'.



Demand

Fig. 2.8

Elasticn -

Demand at point A = $\frac{AD_1}{AD} = \frac{3}{1} = 3$

Hence elasticity of demand at point A is greater than 1.

Elasticity of demand of point B = $\frac{BD_1}{BD} = \frac{2}{2} = 1$

Therefore elasticity of demand at point B is equal to 1.

Elasticity of demand of point C = $\frac{CD_1}{CD} = \frac{1}{3} = 0.999$

The elasticity of demand at point C is less than 1.

The elasticity of demand at point D_1 : $D_1 = \frac{D_1}{DD_1} = \frac{0}{4} = 0$. So the elasticity

The elasticity of demand at point D : D = $\frac{DD_1}{D} = \frac{4}{0} = \infty$. so the

elasticity of demand at point D = ∞.

In this way the elasticity of demand at the point curve is measured.

2.7 Income Elasticity of demand :

When person's income affects the demand for a commodity it results in to income elasticity of demand. As income changes, demand also changes. "The Ratio of change in income to the change in demand is referred as the income elasticity of demand." It measures the responsiveness of demand to changes in income. Therefore

it is defined as "Income elasticity of demand is the ratio of the percentage change in the quantity demanded to the percentage change in Income."

Mathematically, it is put up as :

$$\text{Income elasticity of demand} = \frac{\text{Proportionate change in demand}}{\text{Proportionate change in income}}$$

$$E_y = \frac{\Delta q}{q} \div \frac{\Delta y}{y} = \frac{y}{q} \times \frac{\Delta q}{\Delta y}$$

Where, Ey = Income elasticity of demand

Δq = Change in quantity demanded

q = Original demand

Δy = Change in income

y = Original income.

Income elasticity of demand could be zero, -ve, or +ve. If it is positive, it can be shown as Ey = 1, Ey > 1, or Ey < 1. When it is 1, Income elasticity is unitary. If it is greater than 1, demand is income elastic, and when it is less than 1, demand is income inelastic.

2.8 Cross - Elasticity of Demand :

There are many substitutes or complementary goods available to any commodity in market. Therefore, if there is change in the. price of substitutes, it affects the demand for a particular commodity. Therefore the concept of elasticity of demand is applied to the two commodities related to each other. The relationship between the two commodities can be either substitutive or complementary. In the context of these relationships, the term cross elasticity of demand is used.

Cross elasticity of demand is defined as "The ratio of proportionate change in quantity demanded of commodity A to a given proportionate change in the price of related commodity B."

In order to calculate the cross elasticity of demand following formula is used.

$$\text{Cross elasticity of demand} = \frac{\text{Percentage change in the quantity demanded of A}}{\text{Percentage change in the price of B}}$$

Suppose, that A and B are two commodities substitutes to each other. If the price of B rises and the price of A remains constant, it causes to .rise in the quantity demanded of commodity A. Because the consumers will substitute A for B. on the contrary if price of A rises and B's price remains constant.. It leads to rise .in demand of a commodity B. Because now consumers are preferring B for A.

The cross elasticity of demand may be infinity or zero; Also it may be positive, or negative. When goods are perfect substitutes to each other cross elasticity may be infinity. Where two goods are not substitutes to each other cross elasticity of demand will be zero. It means that change in price of one commodity doesn't affect the demand for another commodity. The cross elasticity varies between two extremes infinity and zero. It depends. upon the degree of substitutability.

When the two goods are substitutes to each other, then the cross elasticity of demand is positive (+ve). When the two goods are complementary to each other, the cross elasticity is negative (-ve).

2.9 Factors determining the elasticity of Demand

Elasticity of demand depends upon the following factors.

1) Nature of commodity : According to the nature of commodities, they are of three types as life necessities, comforts or the luxurious goods. If the goods are .life necessary, their demand is inelastic. On the other hand, if goods are comforts or luxurious their demand is elastic.

2) Total Expenditure : The elasticity of demand of a commodity depends upon proportion of expenditure spended on it. If a small proportion of total expenditure is expended on the goods, it's demand is inelastic. It's demand is not much affected by a change in price e.g. expenditure on Salt. Where the large proportion of total expenditure is absorbed by a commodity, the demand for that commodity is elastic, e.g. expenditure on food items.

3) Substitutes : The elasticity of demand is also dependent upon the substitutability of goods. If the goods are substitutes to each other demand is elastic. On the other hand if they are not substitutes, the elasticity of demand is zero.

4) Several Uses : A commodity is used in various purposes. It's demand is elastic. When it's. price rises, it is used in most urgent uses only, so it's demand falls. If it's price falls it is used in several uses, so it's demand rises.

5) Price level : Where a price of a commodity is very high or-low, the demand for such commodities remains inelastic.

6) Joint demand : The demand for jointly used goods is less elastic. Suppose T.V. and antena are the joint products, if the price of TV prevails very high, the demand for Antena doesn't rise.

7) Income level : Income level affects the elasticity of demand. When income of people remains low, small change in price of the goods will lead to a big change in demand. So the poor people's demand is elastic. On the other hand where the income level is high, demand is inelastic, i.e. rich people's demand is inelastic.

8) Market imperfections : Where market is imperfect the demand is inelastic. When consumer doesn't know about the conditions prevailing in market, the rise or fall in price doesn't affect the consumer's demand.

9) Postponement of demand : When the consumption of the commodity is postponable, the demand for such goods is elastic. If the consumption of a commodity can't be postponed, the demand for commodity is inelastic.

10) Time period : If long run period is prevailing, the elasticity of demand is greater, on the other hand, when short run is prevailing, the demand remains inelastic.

2.10 Applications of Elasticity of Demand in Managerial Decisions

The concept of elasticity of demand is widely used in managerial decisions.

1) Price Fixation : While fixing the price of a product, manager of a business firm in monopoly market or imperfect market takes into account the elasticity of demand of a that commodity. If the demand for commodity is elastic, lower price is fixed. On the other hand the demand for commodity is inelastic, the price fixed is high.

2) Joint Products : In case of joint products the separate costs are not accessed. The producer is guided mostly by demand and nature, a commodity. While fixing, the price of joint products manager takes in to account ifs elasticity of demand.

3) Production : Manager of a business firm decides the total volume of production on the basis of demand for the product. If the demand for product is

elastic, total production is not increased, on the other hand if the demand for product is inelastic, total production is increased. Thus, the concept elasticity of demand is used in making the decisions regarding the volume of production.

4) Useful in distribution : While fixing the rewards of factors of production, the concept of elasticity of demand for the factors of production is used. If the demand for factors of production is inelastic, higher rewards are fixed. On the other hand, where the demand is elastic, lower rewards are fixed.

5) Useful in International trade : Elasticity of demand helps in fixing the terms of trade in international trade. Terms of trade means the rate at which the domestic commodity is exchanged for foreign commodities. These terms of. trade depends on the elasticity of demand of the products of the two countries.

6) Income elasticity of demand : This concept has greater significance in pricing the product to maximize the total revenue in short-run period. Also income elasticity of product is important in production planning and management in long period. Particularly in the period of business cycles. It is used in estimating the future demand as income rises. Thus income elasticity of demand is useful in demand forecasting.

7) Cross Elasticity of Demand : It is useful in changing the price of products, which have substitutes and complementaries. If cross elasticity is greater than one of the substitutes, it is not profitable to increase the price. In this case price reduction proves most beneficial. Thus with the help of cross elasticity of demand firm can forecast the demand for its product.

2.11 Demand Forecasting

In Managerial Economics information about the future demand, costs and capital budgetting is necessary to the business manager in decision making. They are determinant variables of decision making. Therefore demand forecasting is an important factor according to the business manager. A rough estimate of future demand helps to business firms in solving the problems of forecasting the demand for their products.

Demand forecasting means an estimate of future demand for the product of a business firm. Demand forecasting is defined by various economists as follow :

According to 'D. Gopa! Krishna', "forecasting means to know the .trend or behaviour after a period of time.

Another definition states that "demand forecasting refers to an estimate of future demand for the product", or "It is an objective assessment of the future course of demand.

These definitions means that demand forecasting is an estimate of future demand in order to find out the future trend of demand for product. With the help of these estimates firms can determine the volume of it's future production, cost of production as well as capital budgetting decisions. Thus, demand forecasting is usefu! to business manager in decision making,

2.11.1 Kinds of Demand forecasting :

There are two main kinds of demand forecasting. It is classified on the basis of time period and planning requirements of firms. They are classified as :

1) Short term demand forecasting 2) Long term demand forecasting

1) Short term demand forecasting :

This type of demand forecasting is a short period forecasting of demand, for the product of a business firm. They are generally made for the period of one year. It is related with sales, Inputs, price and finances of the business firm. Short term forecasting are essential for the formulation of suitable price policy, cost policy, sales policy, and financial policy of a business firm. If business manager expects a rise in input prices, he could buy it as early as possible. Also he can adopt a policy, which reduces the cost of production and helps to increase the sale of his product. Such policy also provides prior information about production and sales, which is necessary to raise the future capital. Thus, short term demand forecasting means the short period estimates of demand for a product of business firm.

2) Long-term Demand forecasting :

Every manager of business firm is interested in long term business forecasts of demand. These forecasts are made for the period of 5 years, 10 years, 20 years or more than that period. These forecasts are necessary for the expansion of the firm. Total demand for product of business firm can be estimated with the help of long term demand forecasts. Planning for a new plant and expansion of an existing plant depends upon long-term demand forecasting.

Long term demand forecasts are difficult to predic! the demand, costs/sales, prices and competition. Because of very long time period. Various changes take place in economic variables. So, the forecasts made in one time can't be proved true in another time in long run.

2.11.2 Features of Scientific demand forecasts :

Following things are essential to predict more scientific, ideal and more correct demand forecasts.

1) The object of demand forecasts should be clearly stated. It would clearly mention
the purpose of demand forecasting.

2) In order to make correct demand forecasts, there should be suitable method's for demand forecasting. Appropriate methods are to be applied for the demand forecasting.

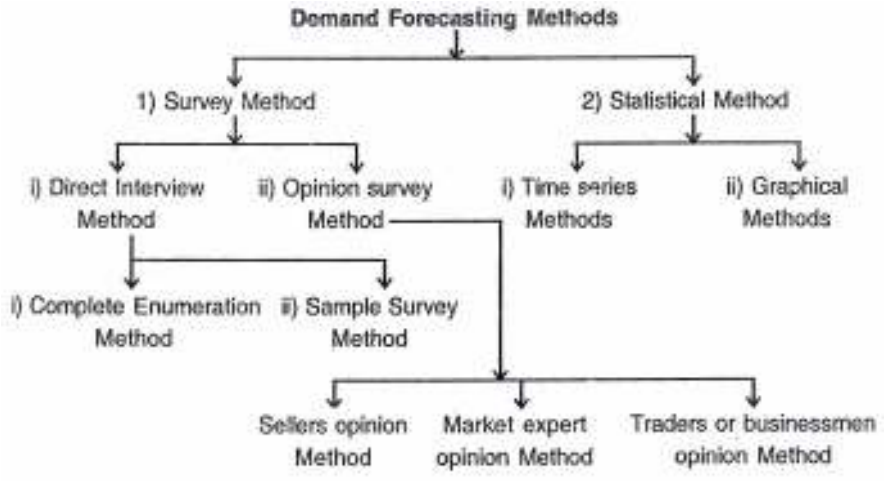
3) Information (Data) in respect of determinants of market demand is to be collected.

4) Collected data should be analysed with the help of various statistical methods to determine the interrelationship between various factors, affecting the market demand.

5) By analysis of the data, the inferences are drawn and demand forecasts are to be made.

2.12 Methods of Demand Forecasting :

There are two main methods of demand forecasting. They constitute various sub-methods as shown in following Chart.



1) Survey Method :

This method is used for the short term demand forecasting. In this method the desires and opinions of the consumers, market experts, sellers, businessmen etc. are collected. It is divided into three parts as i) Consumer's interview method if) Market experts, traders, businessmen opinion survey method and iii) Sellers survey method.

i) Consumer's interview method :

This method stresses on consumers interview. Contacts with consumers are made questionnaire interviewed personally. Enumerator provides questonaire or asks oral questions to the consumers in respect of his product. He asks about their preferences, purchases, quality and future demand for product. Also consumers are to be asked about the proportion in which they may intend to buy. With the help of information collected from the consumer's. interview Enumerator can forecast the demand. This method is most ideal method of demand a forecasting. It gives first hand information about the demand for product.

This method has some limitations. They are as follows. This is very costly and difficulty method. Because of the consumer's are numerious and scattered in all over the economy, So this method is expensive and not useful in practice. All consumers are interviewed, in this method so it is known as "complete enumeration method,' Also it is known as comprehensive interview method. On the contrary when only few selected consumer's or representative are interviewed by this method it is known as "sample survey method." Sample survey is of two types, i) Random sampling ii) Stratified sampling. Sampling method is easy, less costly and very useful. On the

otherhand complete enumeration method is not very; useful in practice, because of the consumers plentyness and scatterdness.

ii) Opinion survey method :

It is another method, of assessment of the short term demand for a product. Under this method the opinions of the sales representatives, professional experts, market experts and consultants etc. are collected. These-are the persons who have the market knowledge, from which information is collected firm asks it's sales representatives to assess the demand for the product in various areas, regions and cities. Sales representatives to assess the demand for the product in various areas, regions and cities. Sales' representatives meet to these persons, they are close to the customers so, they provide the approximate information in respect of future demand for the product. The estimates of demand provided by the salesman from the different regions, areas and cities are added together, the probable demand for a product is computed.

Sometimes, firm can gather information from the professional market consultants and experts. These persons are experienced and experts in respect of market conditions. Through their experience and knowledge they can predict the future demand for a product of a firm. By using this method firm gathers the information in regards to its product and makes future estimate of the product demand. This method is also known as opinion poll method.

This method is easy and simple to collect the information about the demand for firm's product. But it has some-limitations, as firstly, information provided by salesmen and market experts is not fully reliable. It is reliable to that extent of their skill. Secondly, the opinions are subjective and biased, so they are not satisfactory, and reliable. Thirdly, these estimates having equal weightage to good and bad estimates over estimation and under estimation both opinions are equally treated.

2) Statistical Methods :

In order to predict the long-term demand forecasts, the statistical methods are used, this method statistical and mathematical techniques .are used for the long term estimation, of demand. These methods are relied on past data and future trends are traced out. Statistical methods are often used for making demand projections. They are: i) Trend projection method and ii) Regression method. Again two methods are used to project the trends, as follows.

1) Graphical Method

2) Time series method Or Trend Projection Method

1) Graphical Methods :

Under the Graphical method, annual data on sales of a product is collected. This data is plotted on graph. The predication about the demand forecasts are made, with the help of trends in graph. Following example explains the graphical method for demand forecasts.

e.g.

Years	:	1990	1991	1992	1993	1994	1995	1996
Demand	:	1000	1500	2000	2500	3000	3500	4000

What will be the volume of demand in the year 1997 ?

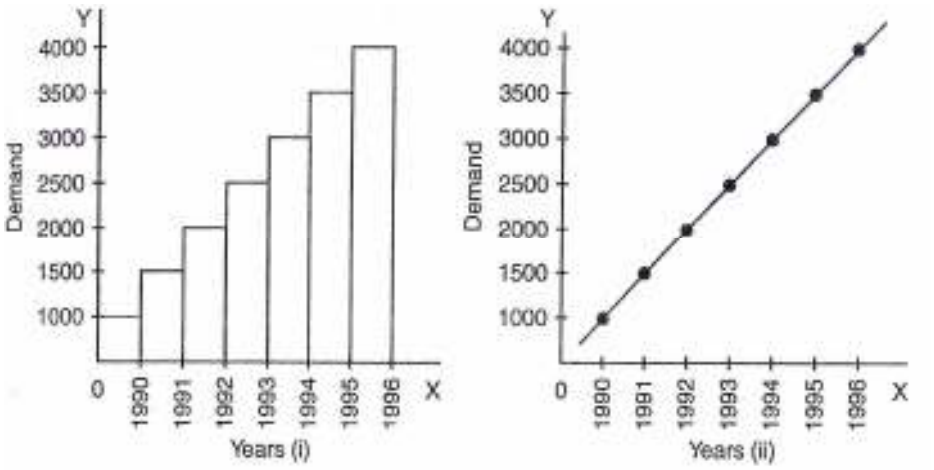


Fig. 2.8.9

Fig. (i) shows bar diagrams. When this method of bar diagrams is used in graphs the heights of each bar reveals the trend of future demand. In the figure (i) height of each bar looks increasing successively. Hence the demand for a product shows rising trend in study period, since 1990 to 1996. So it is judged as the demand will be rising during the future years also. These inferences are drawn with the help of figure (i).

The statistics of demand during the years 1990 to 1996 is plotted on a graph in figure (ii) Various points are drawn by plotting the demand to it's respective years. When we join these points, we will get a curve, which slopes upward from left to

right. It shows the rising trend of demand during the years 1990 to 1996. Hence the inferences are made as the demand for firm's product will rise in future years. Such projection is made with the help of graphical method.

2) Time series Method :

In order to predict the trend of future demand time series analysis is used, in statistics. In this method past data is used to forecast the future demand. This method assumes that past data is useful to predict the future demand. Those factors determine the past trend of demand can determine the future trend in demand. Therefore, study of past data is useful in demand forecasting. Time series analysis comprises the four determinant factors, which are responsible for the changes in demand for a product these factors are as follows.

1) Secular trends
2) Seasonal components.
3) Cyclical changes
4) Irregular changes

First, kind of changes i.e. Secular trends are the regular changes in demand. They are regular rise or fall in demand for the product. This is general tendency to change. These changes are caused due to weather conditions like rain, winter and summer. These are the seasonal components affecting the demand for a product. Third type of changes are related with the cyclical components like economic prosperity and economic depression. When the changes in demand are associated with natural calamities like floods, famine, earth quakes etc. Which are unexpected calamities. Therefore, they are called unpredictable or irregular components. According to the time series analysis, above four types of changes are responsible for the changes in demand. Time series analysis states that changes in demand are caused due to the multiplication or addition of these four variables. So this analysis has developed the multiplication model as well as summation model in respect of these variables.

Multiplication model is stated as.

$$Y = T \times S \times C \times 1$$

Summation model is states as

$$Y = T + S + C + 1$$

Where,

Y = Time series

T = Secular changes

S = Seasonal changes

C = Cyclical changes

I = Irregular changes

In time series analysis there is no any good method to calculate the seasonal, cyclical and irregular changes. Only secular changes are measured with the help of statistical methods. These methods are as follows.

1) Method of Freehand curve.
2) Method of Moving averages.
3) Method of Semi averages.
4) Least square Method.

1) Method of Freehand curve :

Under this method, annual data on sales are collected, and analysed to determine the nature of existing trend. Then this data is protected to show the future trend, results are drawn and forecasts are made. The data is presented in tabular form.

The tabular data is used to plot a graph. The data related to a period of time, so fluctuations may occur as a general tendency.

In this method past data of different years is used for drawing a graph. The points are connected and time series curve is drawn. Then a free hand line is so drawn as the total distance between the freehand line and the time series curve remain minimum. This is illustrated with the help of table below.

Demand for Wheat

Years	Demand (Lacks Tonnes)
1971	50
1972	60
1973	55
1974	70
1975	65

The tabular data is plotted on graph by takine years on X-axis and demand for wheat on Y, axis, A free hand curve is drawn. AB time series curve is drawn to show the demand for wheat during the years, 1971 to 1975.

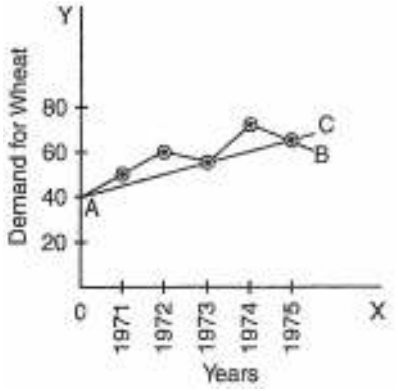


Fig. 2.8.10

Through these various scattered points a trend line AC is drawn so that it keeps the total distance between the freehand line AC and the various points on AB curve minimum. The trend line AC shows the upward trend, so freehand that past trend of demand for wheat is increasing. Hence the future trend of demand for wheat will be rising. In this way the time series analysis forecasts the future demand for firm's product.

2) Least Square method :

In order fit the trend line in to a equation least square method is used. With the help of this method we can find out the nature and magnitude of the trend. The trend line is fitted by developing an equation of line. The method used to construct the line of best fit is least square method. While constructing the line of the best fit trend assumed is to be liner. Sometimes this trend may be curvilinear or parabolic also.

In simple linear equation, the relationship between dependent and independent variables i.e. X and Y is represented in the form of straight line. The equation of this line is as,

$$Y = a + bx$$

where, Y = dependent variable

a = intercept

b = Demand forecast or impact of the independent variable.

In this equation a and b are constants or parameters.

b shows the change in annual demand. The a and b coefficients are. calculated by solving the following equations.

$$\Sigma y = na + b\Sigma x \quad \text{..... (1)}$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad \text{..... (2)}$$

In this equations Y is independent variable, it is sales to be forecast. Sales is assumed to vary with time i.e. year by year. So year (time period) is independent variable x, a is intercept and b is slope of the line are to be calculated with the help of above equations (1)1 and (2).

The values of variables and parameters included in equations (1) and (2) are calculated with the help of table below. Which shows time series data on sales.

Years	Sale of TV (000)
1992	25
1993	30
1994	40
1995	35
1996	50

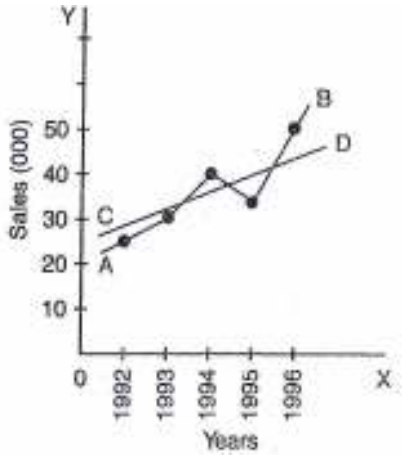


Fig. 2.8.11

By plotting this data on a graph various points of sales related to each year are drawn. By joining these points AB line (or curve) is drawn. Which is Zick-Zack

shaped. Another line CD is drawn through these scattered points on AB curve. The distance between the line CD and various points on the line AB is minimum. The trend line shows the upward trend. This trend line is fitted in equation to find out nature and magnitude of this trend as follows. The trend line is linear. So the equation of this line is Y = a + bx. In this equation x = years (i.e. independent variable) y = sales (i.e. dependent variable).

a = intercept and b is rise in annual sales, i.e. both are parameters. Their values are to be calculated with the help of following equations.

$\Sigma y = na + b\Sigma x$ ..... (1)

$\Sigma xy = a\Sigma x + b\Sigma x^2$ ..... (2)

In order to solve these equations (1) & (2) the above table is represented as follow.

Years	**Sales Y**	**X**	**X^2**	**Xy**
2005	25	1	1	25
2006	30	2	4	60
2007	40	3	9	120
2008	35	4	16	140
2009	50	5	25	250
n = 5	Σy =180	Σx =15	Σx^2 = 55	Σxy = 595

$\Sigma y = na + b\Sigma x$ ..... (1)

$\Sigma xy = a\Sigma x + b\Sigma x^2$ ..... (2)

$180 = 15a + 15b$ ..... (3)

$595 = 15a + 55b$ ..... (4)

In order solve them, the Equation (1) multiplied it by 3, we get,

$= 3 \times 180 = 5a + 15b$ ..... (5)

$= 595 = 15a + 55b$ ..... (6)

Substract eq. (6) from eq. (5)

$= 540 = 15a + 45b$

$= 595 = 15a + 55b$

$-55 = -10b$

= 10b = 55

∴ b = **5.5**

Keep b = 5.5 in equation (3)

	180	=	5a	+	15 x 5.5
=	180	=	5a	+	82.5
=	180	–	82.5	=	5a
			97.50	=	5a
			5a	=	97.50
			a	=	97.50 / 5
			a	=	**19.50**

The equation of the line of the best fit is represented as

y = 19.50 + 5.5 x

The year 2010 is the 6th year in above data. So, keep X = 6 and solve the equation,

Y = 19.50 + 5.5 x

Y = 19.50 +5.5 x 6

Y = 19.50 + 33

T = 52.50

Thus with the help of past years data forecast about the sales fot the year 2010 will be made as 52.50 thousands of TV. Sets.

2.12.1 Regression and Correlation Method :

Regression and correlation methods are used in demand forecasting. These methods combines economic theory and statistical techniques together to forecasts the demand. The determinants of demand for a product are specified with the help of economic theory. The relationship between these determinants and demand for a product is specified by the economic theory. Thus general form of demand function is determined by the economic theory. The statistical theories are used to estimate the values of constants i.e. parameters. In these methods past data is used to reveal the future trend. When there is one or more variables, and the functional relationship

between these variables is analysed, it is called imple correlation. When the relationship is analysed between demand and many variables, it is called multiple correlation. In correlation analysis we analyse, the nature of relationship between variables while in regression the extent of relation between variables is analysed. The results are drawn in mathematical form.

In regression analysis, of demand forecasting, demand function for a product is estimated. There are two types of variables, dependent and independent variables. Quantity of demand to forecast is dependent variable and the factors affecting the demand or determine the demand are the independent variables.

e.g. Demand for TV sets depends upon the income and population residing in a city. Here demand for TV sets is dependent variable and income and population are the independent variables affecting the demand for TV sets. .

Demand function is single variable or multi-variable demand function. When a demand for commodity is affected by one variable only, It is called single variable demand function, e.g suppose demand for rice is only determined by the city population. It is single variable Function i.e. D = f (p). When demand for rice is dependent on number of variables like price, population, income, prices of its substitutes etc. it is multi-variable function i.e.

D = f (P, l, Pr, Sp.....n) :

D = Demand

f = Function

P = Population

I = Income

Pr = Price

Sp = Prices of Substitutes

n = Number of variables.

For single variable function, simple regression equation is used for demand forecasting.

2.12.2 Simple regression :

In simple regression analysis a single independent variable is used to estimate the value of the dependent variable i.e. whose value is to forecasts. This technique is similar to the fitting of trend line. the difference between the trend and regression technique is only that in trend fitting time is independent variable. Where as in regression equation independent variable is most significant determinant of the demand.

In order to explain this method consider the following tabular data.

Year	Population (crs)	Sale of TV sets (000)
2001	5	25
2002	7	30
2003	10	40
2004	8	35
2005	15	50

Suppose that we have to forecasts the demand for TV sets for the year 2006, with the a help of this tabular past data. It is forecasted by estimating a regression equation of the form.

$Y = a + bx$

Where,

Y = Sale of TV sets

X = Population

a and b = Constants or Parameters

The values of a and b constants are calculated with the help of folloiwng equations.

$\Sigma y = na + b\Sigma x$ ..... (1)

$\Sigma xy = \Sigma xa + b\Sigma x^2$ ..... (2)

In order to calculate the values of a and b above table is presented in the form as follows :

Year	Population (X)	Sale of TV sets (Y)	X^2	XY
2001	5	25	25	125
2002	7	30	49	210
2003	10	40	100	400
2004	8	35	64	280
2005	15	50	225	750
$\Sigma n = 5$	$\Sigma x = 55$	$\Sigma y = 180$	$\Sigma x^2 = 463$	$\Sigma xy = 1765$

Put these values in equations (1) and (2).

$\Sigma y = na + b\Sigma x$ ..... (1)

$\Sigma xy = \Sigma xa + b\Sigma x^2$ ..... (2)

$180 = 5.a + b.55$ ..... (1)

$1765 = 55.a + b.463$ ..... (2)

Multiply eq. (1) by 11 and subtract if from eq. (2) and solve the equations.

$180 = 5.a + 55.b$ (1) x 11

$1765 = 55a + 463.b$ (2)

$1980 = 55.a + 605.b$ (1)

$1765 = 55.a + 463.b$ (2)

$0215 = 142.b$

$: 142\ b = 215$

$= b = 215/142$

$b = 1.514$

Keep this value

b = 1.5 in equation (1)

$180 = 5.a + 55 \times b$

$180 = 5.a + 55 \times 1.5$

180 = 5a + 82.5

180 - 82.5 = 5a

97.5 = 5a

5a = 97.5

a = 97.5/5

a = 19.5

Put these values a = 19.5, and b = 1.5 in equation.

Y = 1 + bx

Y = 19.5 + 1.5x

Suppose population increase for the year 2006 will be 20 crores. Therefore X = 20 for the year 2006. Hence the demand for TV sets for the year 1997 may be computed as'

Y = 19.5 +1.5x20

Y = 19.5 +30

Y = 49.5 Thousands of TV sets.

2.12.3 Muiti-variate Regression :

When a demand function is dependent upon number of variables, it is called the multi-variate regression, or when number of variables is greater than one.

While calculating the multi-variate regression analysis first step is to specification of variables, which are responsible for the change in demand.

These variables are generally choosen from the determinants of demand. They are price, income, consumer's tastes and preferences, prices of substitutes etc. while estimating the demand for durable goods like, house, car, TV, refrigerators etc. various variables like availability of/credit, interest rate, are to be considered.

When the goods are capital goods, like machinery and equipments variables like corporate investment, depreciation rate, cost of capita! goods, input costs, rate of interest, etc variables are considered. These variables are the independent variables.

Once the independent variables are traced out, the second step is the collection of data for time series in regards to the independent variables.

Third step is to specify the form of equation, which describes the relationship between dependent and independent variables.

The last step is the estimation of the parameters in the specified equation, with the help of statistical methods.

Specifying the form of Equation :

Demand forecasts are dependent on the form of equation and the consistency of the dependent variables n the demand function for their reliability. The greater the degree of consistency, higher will be the reliability of the demand forecasts and vice versa. So, equation is carefully specified. Following are the some kinds of demand functions, illustrated as :

Linear Function :

This is most common form of equation used for demand forecasting. In this equation the relationship between demand and its determinant variables is linear, i.e. straight line, It is stated as

$$Y = a + bx + Cy + dPs + eA \quad \ldots (1)$$

where,

Y = quantity demanded

x = Price of commodity

y = Consumer's Income

Ps = Price of Substitute

A = Advertisement Expenditure

a is constant and b, c, d, e and J are the parameters. They express the relationships between demand and the variables X, Y, Ps and A respectively.

In this linear demand function, quantity demanded is assumed to change at a constant rate with change in independent variables X, Y, Ps and A. The value of parameters is estimated by using least square method. After the estimation of the

values of parameters, the forecasts of demand can easily be made on the available data. For independent variables. ... . .

Suppose, the estimated equation for the TV sets takes the following form as :

$Q = a + bP + CY + dPs + eA$

Let us assume that

b = 0.5, c= 0.75, d=1, and

e =s 1.5.

Changes in independent variables are as

P = 1%, Y=2%, Ps=3% and A=4%. . ... .

$Q = 0.5 \times 1 + 0.75 \times 2 + 1 \times 3 + 1.5 \times 4$

$= 0.5 + 1.5 + 3 + 6.0$

$= 11\%$

Thus aggregate change in demand is 11%.

Power Function :

In linear equation the marginal effect of independent variables on demand is assumed to be constant, and independent of change in each variable, e.g. !S assumes that the marginal effect of change in price is independent of change in income, or other independent variables and so on.

But changes in variables are nor independent, neither constant. They are acting and reacting on each other. So they are interrelated with each other. Therefore, in order to consider these changes multiplicative form of equation for the demand function is considered to forecast the demand. It is expressed in the form of power functions as:

$Q = aP^b Y^c P^d A^J$

This algerbraic form of multiplicative equation can be transformed into logarithmic form and which is linear as :

Log Q = log a + b log P + C log Y + d log Ps + J log A.

This log linear demand function is estimated by the least square method. The estimated function yields the intercept a and the values of coefficients b, c, d, and J. After estimation of these coefficients, the data for independent variables is obtained to demand forecasts.

2.12.4 Importance of demand forecasting :

Forecasting of demand is very necessary process in managerial decision making. These forecasts are important to the enterpreneurs, producers, firms and industries. It is important in regards to the following points.

1) To under stand future quantitative demand :

By analysing the past data we can find out the future demand in quantity. So it is essential for future planning to the firms and industries.

2) To predict supply of commodities :

Demand forecasting shows the approximate future demand for a commodity in physical quantity. With the help of this future demand producer can decide future supply and production of his product.

3) To Predict the price of commodity :

Demand forecasting helps to firm or producer to understand the future price of his product. With the rise and fall in future demand, he can forecast in respect of future price.

4) Useful for capital budgetting :

Demand forecasting is also useful in capital budgetting. With the help of demand forecasts, producer gets the idea in respect of future demand for his product. If future demand remains high he forecasts that more capital is required to fulfill it. So tie tries to search the different sources of capital accumulation.

5) Useful in resource Planning :

Demand forecasting is useful to producer or firm in resource planning, i.e. in capitals budgetting as well as in personnel planning.

6) Firm can determine the sales targets :

Demand forecasting also helps in determining the sales targets to the firm; Demands forecasts provides rough estimates of future demand. By using, it firm can determine the target of future sales for it's product.

7) Useful in inventory management :

It Is useful to producer in inventory management. With the help of demand forecasts firm can decide the stock of raw material to fulfill the future demand, larger the future demand larger will be the demand for stock of raw material and vice versa.

8) Useful to industrial expansion :

Demand forecasting helps to the firm and industry to take the decision in regards to the expansion or contraction of their business. Higher future demand for firm's product leads to the expansion of it's business and vice versa.

2.13 Indifference curve : Meaning, Properties, Consumer's equilibrium through Indifference Curve and Revealed Preference Theory

Introduction:

In this topic we are dealing with the meaning and properties of Indifference curve. Further we shall see the consumer's equilibrium with the help of Indifference curve.

The Indifference curve approach was first of all invented by a classical economics **Edgworth**. He used this technique to show the possibilities of exchange between two persons and neglected to explain the consumer's demand. J. R. Hicks and R.G.D. Allen in their well-known paper "A reconsideration of the Theory of Value" ruthlessly criticized Marshall's cardinal approach and put forth the concept of indifference curve which was based on ordinal utility. This same article he had reproduced in 1939 in his book "Value and Capital".

Meaning of Indifference Curve

Indifference curve has retained some of the assumption of Marshall's cardinal utility analysis such as rationality, continuity of ranking the combinations of goods till the consumer yields the satisfaction.

The supported of Indifference curves theory thinks that utility is a psychic entity and it cannot be measured in quantitative/cardinal terms. Thus, indifference curve depends on the ordinal utility approach. The ordinal utility implies that the consumer is cabable of simply comparing the different levels of satisfaction. The basis of indifference curve analysis of demand is the preference indifference hypothesis.

Assumptions of Indifference curve Analysis

1) More of a commodity is better than less (Non-satisfy)
2) Preference or indifference of a consumer are transitive.
3) Diminishing Marginal rate of substitution

What is indifference curve?

"The indifference curve means the Locus points on the indifference curve are the combinations of goods, which gives equal amount of satisfaction to the consumer." In other words, all the combinations of two goods lying on a consumer's indifference curve are equally desirable or equally preferred by him and also he is indifference about them.

To understand indifference curve, it is better to begin with indifference schedule. In the table 2.4.1 Indifference schedule is given.

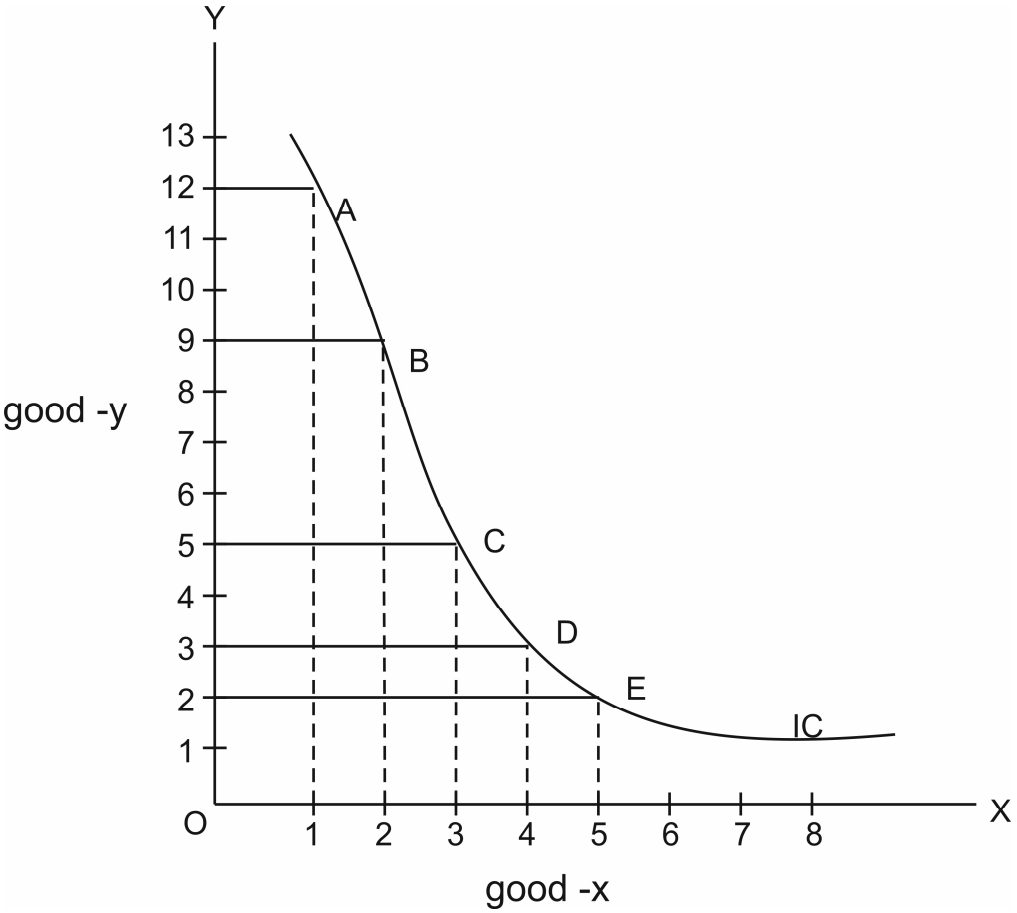
Table 2.4.1 – Indifference Schedule

Combination	Good – X	Good – Y
A	1	12
B	2	8
C	3	5
D	4	3
E	5	2

In the above table, indifference schedule, indicates that consumer has to start with 1 unit of X and 12 units Y. When a consumer prefers combination 'B' he is willing to give up 4 units good-Y for the gain of one additional unit of good-X i.e. (2x+8y.) Further, the successive increments in his stock of X he is giving up Good-Y. As such we get combinations 3x+5y, 4x+3Yand 5X+2Y. Thus, combinations A=B=C=D=E are giving equal amount of satisfaction to the consumer. But the question before him is, which combination should be selected? because he is indifferent about them.

Now, we have to convert the indifference schedules into indifference curve by plotting the various combinations in the following Fig – 2.9

Fig. 2.9



In Fig. 2.9 indifference curve.

IC is drawn by plotting the various combinations of the indifference schedule depicted in the table – 2.4.1

OX axis Good X is measured

OY axis Good Y is measured

A=B=C=D=E combinations are giving equal level of satisfaction. The smoothness and continually of an indifference curve mean that good in question are assumed to be perfectly divisible.

Marginal Rate of Substitution

The concept of Marginal Rate of substitution is an important tool of indifference curve analysis of demand. The Marginal Rate of substitution means "it is the rate at which the consumer is prepared to exchange good X and Y, so that his level of satisfaction remain the same." Let us we should see the indifference schedule with MRSxy.

Table : 2.4.2 Indifference schedule with MRSxy.

Combination	Good – X	Good – Y	MRSxy
A	1	12	-
B	2	8	1:4
C	3	5	1:3
D	4	3	1:2
E	5	2	1:1

Table – 2.4.2 indicates that when a consumer moves from 'A' to 'B' combination he substitutes one unit & good-x too four units & good-Y i.e. (1:4) this continues up to 'E' combination. This MRSxy is diminishing in nature ie. Combination 'B' (MRSxy-1:4) Combination 'C' (MRSxy-1:3) combination 'D' (MRSxy-1:2) and so on. The following two factors are responsible for diminishing Marginal Rate of substitution.

First the want for a particular good is satiable so that as the consumer has more and more of a good the intensity of his want for that good goes on declining.

The second reason for the decline in marginal rate of substitution is that the goods are imperfect substitutes of each other.

Relationship Between MRS & Marginal Utilities

Mathematically can be expressed in the following.

MRSxy between goods is equal to the ratio of marginal utilities of good X&Y.

An Indifference curve can be represented by

$U(x,y) = a$ (i)

$\therefore$ a = constant utility along an Indifference curve.

Taking total differential of (i) above

$\frac{dU}{dX}$ dX + $\frac{dU}{dY} = 0$

$\frac{dY}{dX} = \frac{\frac{dU}{dX}}{\frac{dU}{dY}}$

$\frac{dU}{dX}$ and $\frac{dU}{dY}$ are marginal utilities of goods X and Y respectively.

$$\frac{dy}{dx} = \frac{MUx}{MUy}$$

$\frac{dy}{dx}$ is the slope of indifference curve and represents MRS_{xy}. Thus,

MRSxy = $\frac{MUx}{MUy}$.

Properties of Indifference Curve

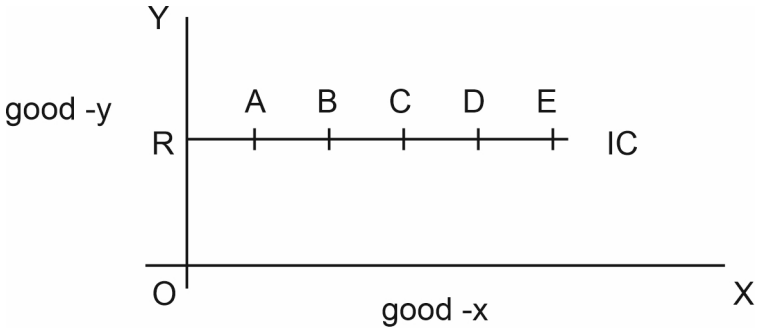
We have observed the meaning of indifference curve and its assumptions. On the basis of it we should understand the various properties of Indifference curve, as it has been given below.

1) Indifference curves slope downward to the right :

An Indifference curve has negative slope. Indifference curve slopes downward from left to right due to diminishing Marginal Rate of substitution. In other words the indifference curve slopes downward means the amount of one good is increasing and other get reduced in the given combination. It is clear that an indifference curve on which those combination of two goods lie that yield same level of satisfaction to the consumer. To support this fact we must find following three impossible shape of indifference curves.

a) Indifference curve cannot be a horizontal straight line shown in Fig. 2.10 A

Fig. 2.10 A



As indicated by Fig. 2.10 (A) The Indifference curve cannot be horizontal straight line. At each combination i.e. A, B, C, D, and E amount of good-x is increasing but amount of good-y is constant i.e. 'OR' of good-y. Therefore, IC cannot be horizonatal straight line.

b) Indifference curve cannot be a vertical straight line.

The vertical straight line IC means the amount of good-y in the combination increases and the amount of good-x remains the same. This can be explained with the help of Fig. 2.10 (B).

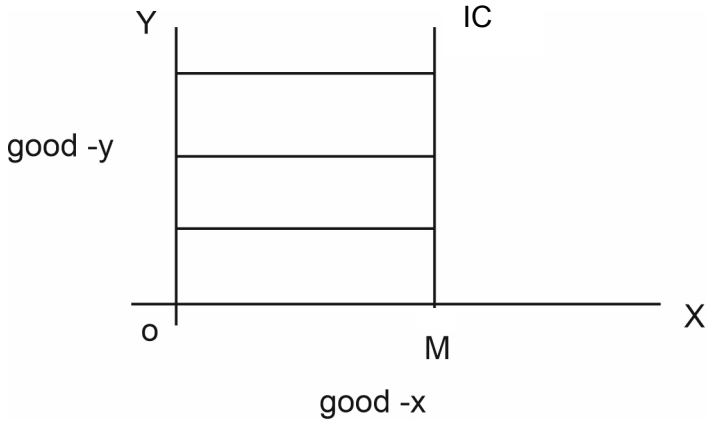


Fig. 2.10 (B)

As shown in the Fig. 2.10 (B) the indifference curve cannot be a vertical straight line.

Good – X – OR Combination 'A'

Good – Y – OP

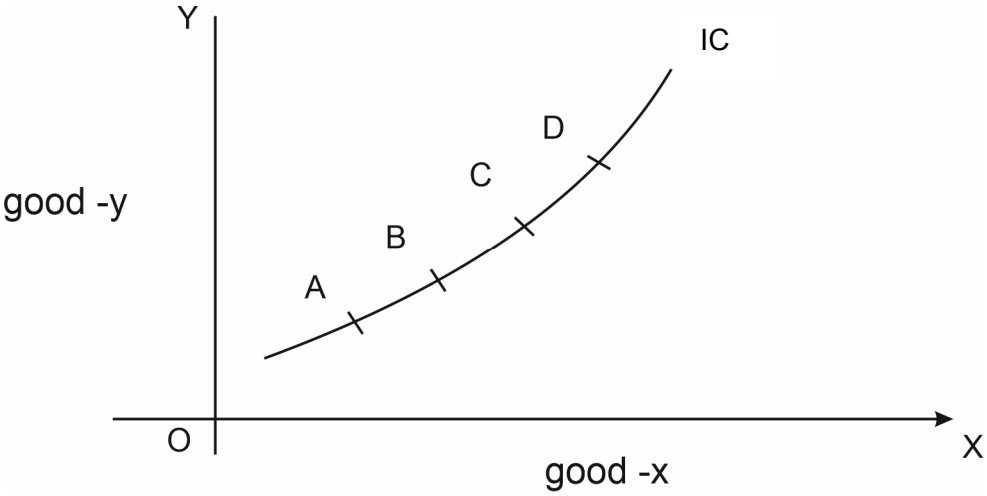
Good X – OR Combination ‘B’

Good Y- OQ

c) Indifference curve cannot slopes upward to the right.

Upward – sloping Indifference curve means that the amount of both the goods increase as one moves to the right along the curve. This can be explained in Fig. 2.10 C.

Fig. 2.10 (C)



Hence, As shown in the fig. 2.10 (C) the indifference curve cannot be upword sloping curve to the right.

2) Indifference curves are convex to the origin.

Generally, indifference curve is convex to the origin. It means the indifference curve is relatively flatter in its right hand portion and relatively steeper in its left hand portion. This property of IC curve is based on the Diminishing marginal rate of substitution (MRSxy). If an indifference curve is concave to the origin means, it imply that the increasing marginal rate of substitution. (MRSxy)

Likewise, an indifference curve cannot be a straight line slopes downward from left to right, except when goods are perfect substitutes. In other words, a straight line Indifference curve means marginal rate of substitution remains constant. Therefore, following are the impossible diagrams of indifference curves.

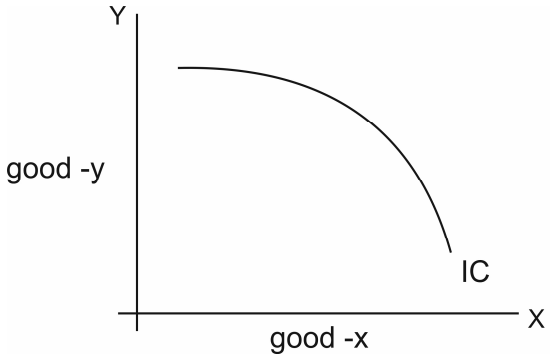


Fig. 2.11 (A)

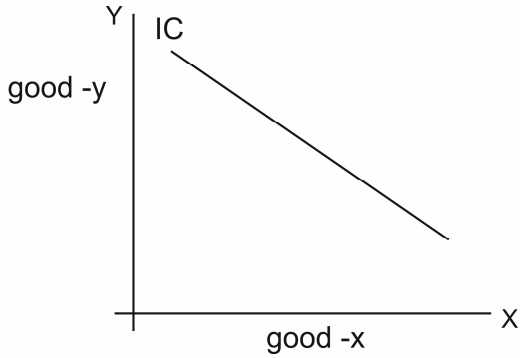


Fig. 2.11 (B)

Indifference cannot be concave

Indifference curve cannot be straight line expect in case of perfect substitutes

3) Indifference curves cannot intersect each other.

Two indifference curves cannot intersect each other. This can be explained through Fig. 2.12

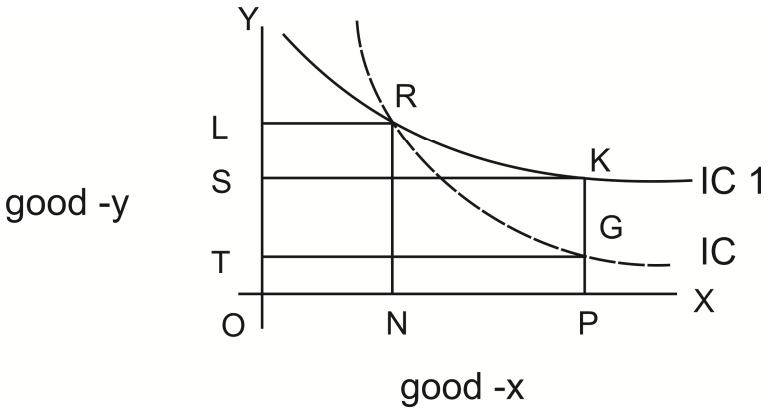


Fig. 2.12

As in the Fig. 2.12 The IC and IC_1 are intersecting each other at point 'R'.

Which is absurd or self-contradictory

All the combinations lie on indifference curve are giving equal level of satisfaction But R and K are not giving equal amount of satisfaction. This can be expressed with following explaination.

The IC_1			Good X		Good Y
At Combination	R	-	ON	+	OL
,,	K	-	OP	+	OS
The IC	R	-	ON	+	OL
	G	-	OP	+	OT

Here combination K>G even it is equal to R. On the IC_1 at K combination the amount of good y is OS which is greater than at G combination lies on IC i.e. the amount of good y - OT

Therefore if R= K=G.

But Infact K≠G.

∴ K>G. ?

4) Higher Indifference curve gives higher level of satisfaction and vice-versa.

Indifference map shows the bunch of IC curves. It indicates that higher IC curves gives higher level of satisfaction and lower level IC curves gives lower level of satisfaction.

As the consumer's income rises, he purchase more units of both commodities and selects such combinations of two goods, which would be giving him higher level of satisfaction. On the contrary, if consumers income falls, he buys less units of both goods such combinations of two goods gives him lower satisfaction.

Hence as the income of the consumer rises, he moves to higher IC curves and vice-versa.

The above explaination can be depicted in the following diagram. 2.13

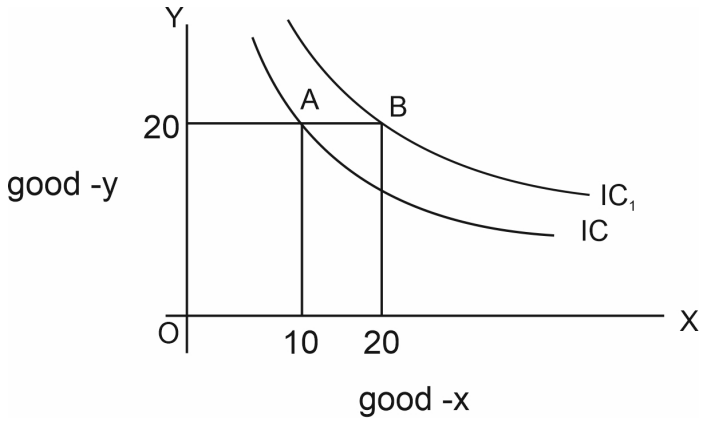


Fig. 2.13

In the Fig. 2.13 we find that IC_1 falls below the IC curve. The combination 'A' lies on IC curve and combination 'B' lies on IC_1 curve. The combination 'A' is of 20 units of good-Y + 10 units of good – X and combination B is of 20 units of good-Y + 20 units of good-X. It means that combination 'B' lies on IC_1 which contains more of good - X i.e. 10 extra good-x and surely it gives greater satisfaction than combination 'A'. Hence, the combination lies on IC_1 curve gives more satisfaction than IC.

5) Indifference curves need not be parallel to each other:

As we know that higher IC gives higher level of satisfaction but it is not necessary that the sets of IC curves should be parallel. As each IC curve reveals different marginal rate of substitution for different combination lies on it. In fact the marginal rate of substitutions are not similar. This can be shown in Fig. 2.14.

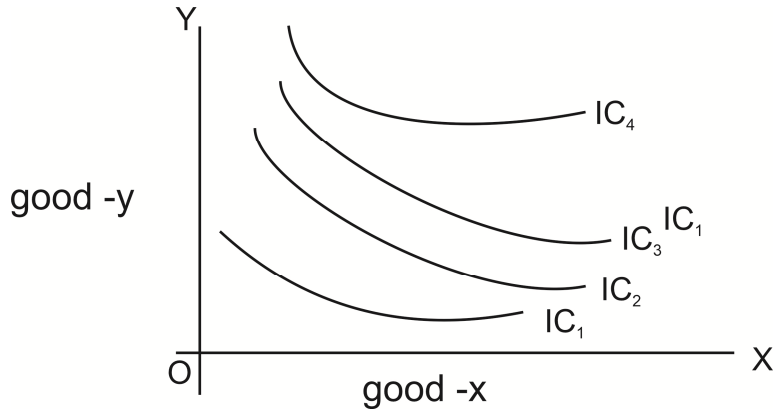


Fig- 2.14

The above figure indicates that IC, IC_2, IC_3 and IC_4 are not parallel to each other.

6) Indifference curve will not touch either axis

The important property & IC is that IC curves will not touch either X axis or Y-axis. This could be explained with help of following Fig. 2.15 (a) Fig. 2.16 (b)

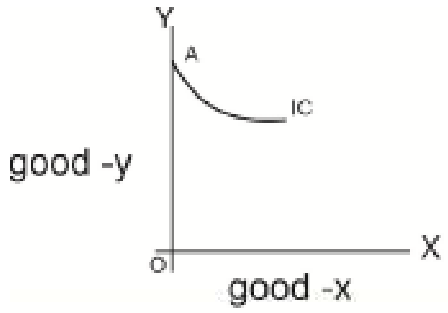


Fig. 2.15 (a)

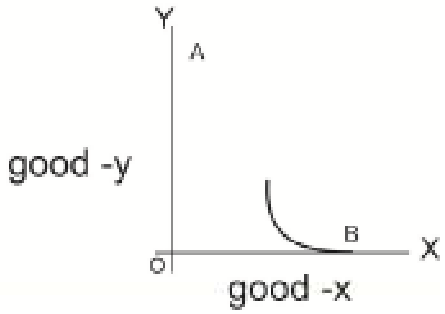


Fig. 2.15 (b)

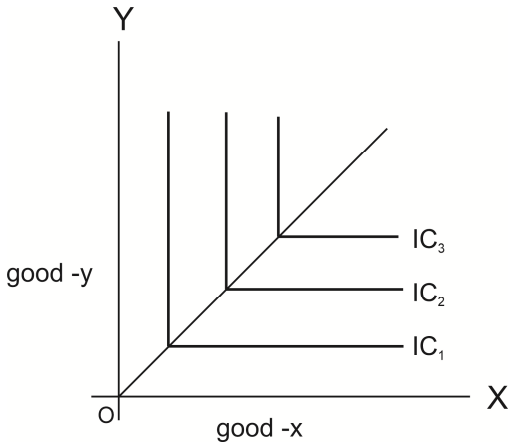
In fig. 2.15(a) IC curve touches to Y-axis at point 'A'. The combination 'A' contains of good Y is of OA plus good – X zero, which indicates that MRSxy is infinite.

In fig. 2.15 (b) IC curve touches to X-axis at 'B'. The combination 'B' contains of good Y is of OB plus good-Y is zero which also indicates that MRSxy is infinite.

7) Indifference curve for perfect complement goods

When the two goods are perfect complementary, the indifference curve will consist of two straight lines with a right angle bent which is convex to the origin shown in the Fig. 2.16

Fig. 2.16



In case, perfect complement goods the shape of the indifference curve is rectangular hyperbola.

2.13.1 Consumer's Equilibrium with IC

Before knowing the consumer's equilibrium with indifference curve it is necessary to know the concept of Budget line. The budget line which represents the prices of the goods and consumer's money income. Thus, budget line is also called as price line.

Concept of Budget line or Price line

Suppose a consumer has got income of Rs. 50 to spend on two goods i.e. X and Y. Let price of the good X in the market be 10 per unit and price of good-Y that of 5 per unit. If the consumer spends his whole income of 50 on good X he would buy 5 units of X; if he spends his whole income of 50 on good Y he would buy 10 units of Y. If a straight line joining 5x and 10Y is drawn, we will get that is called the price line or budget line. Hence, Budget line means all those combinations of two goods which the consumer can buy by spending his given money income on the two goods at their given price. This can be shown in following Figure – 2.17.

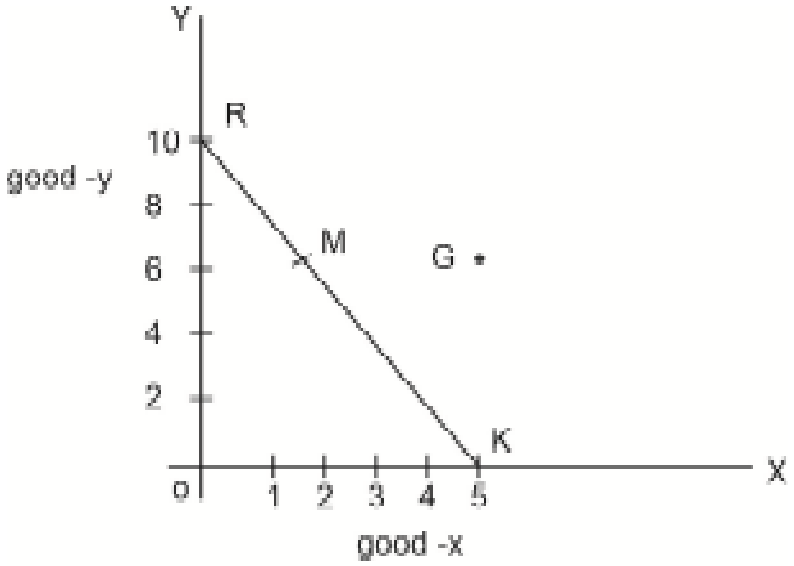


Fig. 2.17

Budget line shown in graphical way i.e. Fig. 2.17

In the fig. 2.17 with Rs. 50, consumer can by 10Y and 0X, or 8Y and 1x; or 6X and 2Y; or 4Y and 3x e.t.c. Thus, he can buy any combination lies on the budget line with his given money income and given price of the goods. Any combination lies

above Budget line i.e. 'G' cannot be purchased. But, he can choose M except R and K combinations.

Thus, Budget line can be written algebraically as follows.

PxX + PyY = M

Px & Py = Price & commodity X & Y.

X and Y = Goods X and Good Y.

M = Money income.

Thus the slope & Budget line is equal to…..

Slope of Budget line = $\frac{OR}{OK} = \frac{Px}{Py}$.

The budget line shifts on the basis of the change in the price of respective goods.

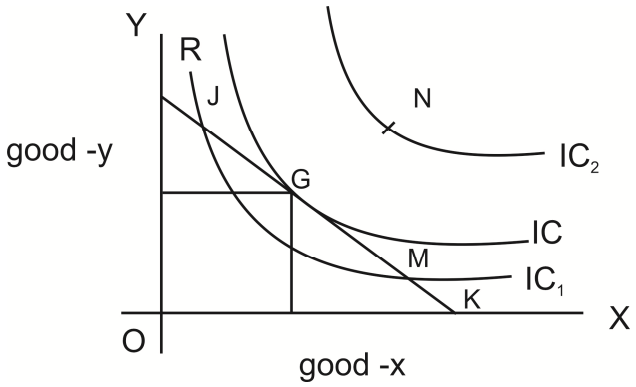
Consumer's Equlibrium with the help of IC.

After realizing the budget line now we are in position to understand that how a consumer reaches at equilibrium position.

Assumptions:

1) Consumer maximizes satisfaction.
2) Consumer is rational.
3) The consumer has a given indifference map exibiting his scale of preference for various combination of two goods i.e. x and y.
4) He has fixed income and has to spent whole income on both goods.
5) Price of goods are given.
6) Goods are homogeneous and divisible.
7) Consistency and transitivity.

With help of above mentioned assumption, we may understand how a consumer can achieves the equilibrium position. Consumer's equilibrium is shown with the help of indifference curve and budget line as given in the following Fig. 2.4.10.



The fig. 2.4.10 indicates that consumer has set of indifference curves i.e. IC,IC_1 and IC_2 along with the RK budget line.

The RK budget line reveals that how many units of good-X and good-Y the consumer can purchase with his given money income. In fig. 2.4.10 it is noticed that a higher Indifference curve gives higher level of satisfaction and lower Indifference curve gives lower level of satisfaction.

The Fig. 2.4.10 explains that

RK = Budget line/price line

IC, IC_1 & IC_3 = Three indifference curve.

G = Equilibrium position. It is the tangency point where the slope of budget line RK and indifference curve IC are equal.

The slope of IC means MRSxy

The slope of Budget line means Px/Py.

Therefore, we arrive with equation. viz

MRSxy= $\frac{Price\ of\ good\ x}{Price\ of\ good\ Y} = \frac{Px}{Py.}$

At point R and K MRS is greater or less than price ratio between the two goods. The consumer substitutes good X for good Y till he marginal rate of substitute becomes equal to the price ratio.

The marginal rate of substitution at point J and M are less than the given price ratio in fig. 2.4.10. he continues the process of substitute till he reaches at point G combination

The combination laying on the IC_2 is beyond the reach of consumer on the income terms.

Finally, the tangency between the given priceline/budget line and an indifference curve i.e. MRSxy = Px/Py is a necessary condition but not a sufficient condition of consumer equilibrium with IC.

Therefore, it is concluded that for the consumer to be in equilibrium the following two conditions are required.

1) MRSxy = Px/Py.

2) Indifference curve must be convex to the origin at the point & tangency

2.13.1 Revealed Preference Theory

This theory is given by 'Prof. Samuelson'. It is behaviouristic ordinal utility analysis. Revealed preference theory is called the third root of the logical theory of demand. Samuelson given this theory in order to have a scientific explaination of consumer behaviour. Both Marshallian utility analysis and Hicks-Aliens' Indifference curve analysis have their own limitations. Viz, introspectiveness and subjectiveness as well as unrealistic and restrictrive assumptions. Therefore, Prof. Samuelson' built up the theory of demand from observed behaviour of consumer. This theory analyses consumer's preference for a combination of goods on the basis of observed consumer behviour in market in various price income situations.

Revealed preference theory is based on the presumption that "Choice reveals preference." Keeping this in mind consumer buys a combination of two goods because of he likes this combination as compared to others or it is cheaper than others. Either of one reasons, consumer buys this combination instead of other combinations. Suppose there are many combinations viz. A, B, C, D, E, F, etc. as shown in diagram. Suppose he prefers combination A rather than combination B, C, D, E or F. It means that he reveals his preference to combination A. There are two reasons for showing his preference to combination A. They are as, 1) Combination A may be cheaper than other combinations B, C, D, E and F. or 2) Combination A likes him more than other combinations even though it is dearer. Thus, It is said that A is revealed preferred to other combinations B, C, D, E and F. Or other combinations B, C, D, E, F are revealed inferior to A.

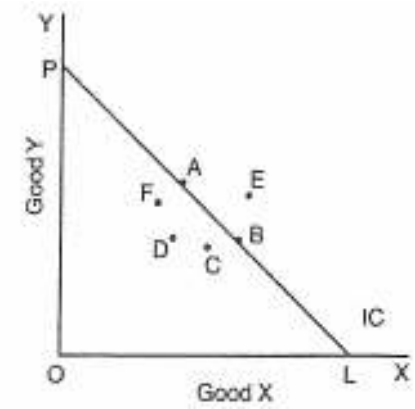


Fig. 2.8.1

PL is price line. Consumer's income and prices of two goods are given. Consumer can buy any combinations of X any Y lied in the area of triangle OPL, with the help of his pL price income line. 'It means that consumer can choose any combinations from A, B, C, D, F which are lied below or on the line pL. But he can't choose combination E, because it is lied above price-income line pL. So it is dearer and beyond the reach of consumer. When he chooses A to B combination. A is revealed preferred to B, because of he likes A more than B. Other combinations C, D, F lies below the price line pL So they are inferior to A. Thus the combinations A is revealed preferred to other combinations. B, C, D and F.

Assumptions :

This theory is based on following assumptions :

1) It assumes strong ordering : This hypothesis is based on strong ordering on the part of the consumer. It assumes that consumer is in a position to tell that which combinations he prefers to the other. So, there is no possibility of indifference between two combinations.
2) The consumer's tastes remain constant.
3) Consumer's choice reveals his preference to the combination.
4) Consumer chooses only one combination.
5) More goods combination is always preferred to less goods combination in any situation.
6) Consistency Assumption: This theory assumes that there is consistency in consumer behaviour. If A is preferred to B in one situation, B can't be preferred to A in any other situation.

7) Transitivity assumption : It refers three term consistency. When A is preferred to B and B to G, then A must be preferred to C.

8) Assumption of positive income-elasticity: This theory assumes positive income elasticity of demand. As consumer's income increases it causes to rise in demand for a commodity and vice versa.

Derivation of Demand Theorem :

The derivation of demand theorem from revealed preference theory is the study of samuelson's "Fundamental Theorem of Consumption Theory. Samuelson stated it as", any good (Simple or composite) that is known always to increase in demand when money income alone rises must definitely shrink in demand when its price alone rises." It means that when income elasticity of demand is positive, price elasticity of demand is negative, i.e. there is positive correlation between income arid demand for commodity and inverse relationship between price and demand for commodity, in regards to change in income demand curve slopes positively, and with regards to price change it slopes negatively.

In order to prove demand theorem, it is divided into two parts as

1) Demand theorem for price rise
2) Demand theorem for price fall

1) Demand theorem for price rise :

Suppose that consumer spends his total income on two commodities oranges and apples PL, is original price line as shown in figure.

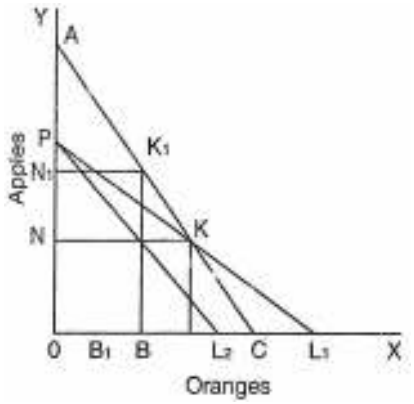


Fig. 2.8.2

Suppose that PL_1 is an Original price line. So, OPL_1, triangle is a consumer's choice triangle. It means that consumer can purchase any combinations lied in this

triangle as well as lied on PL, price line. Suppose consumer has preferred combination lied at point K. It means he revealed his preference to OB quantity of oranges and ON quantity of apples lied at Point K.

Now, the price of apples remains the same and price of oranges is risen. It causes the shift of price line PL_1 to PL_2. It shows the shrink in quantity of Oranges demanded. Therefore now consumer is not able to purchase the combination of two goods lied at point K.

In order to get consumer able to purchase the same combination at point K consumer's money income should be raised to that amount equal to his fall in real income due to rise in price of Oranges. So a parallel line AC is drawn to the PL, price line. Which passes through point K. AC price line shows a slew triangle of Choice OAC. Now consumer is able to choose all combinations lied in or on this triangle OAC.

The point K on original price PL is preferred by him to any other points on that price-line. So all points lying below K would not be preferred by him. (i.e. consistency assumption) Therefore, all the points lying below the point K should not be preferred to the point K lying on KL_1, line i.e. he rejects ail the points below point K.

Now consumer will choose combination either at point K or above the K, which are lied on the part KA of new price line AC. in this situation consumer will choose any combinations lied on KA line, which reveals less quantity of oranges and more of apples. It means that when price of oranges rises, consumer will choose the combination at point K or above the point K. Suppose he has chosen the combination lied at point K_1, it shows. ON, apples and OB, oranges, i.e. he buys BB, less quantity of oranges due to rise in it's price. Hence, It is clear from the above discussion that as price of Oranges due to rise in it's price. Hence, It is clear from the above discussion that as price of Oranges rises, it's demand falls. It shows the inverse relationship between price and demand of a commodity. So, demand curve is negatively slopped.

2) Demand theorem for price fall :

When price of a commodity falls it results into rise in demand. It shows inverse relationship between price and demand of a commodity. It can be explained with the help of diagram. PL_1 is original price line. Consumer reveals his preference to the combination of two goods lied at point K. At point K he prefers ON apples and OB

oranges. Triangle OPL, is his choice triangle. It means that consumer buys any combinations lied in and above the line PL_1 of this triangle. Suppose that price of oranges is fallen, so that price line PL_1 becomes PL_2.

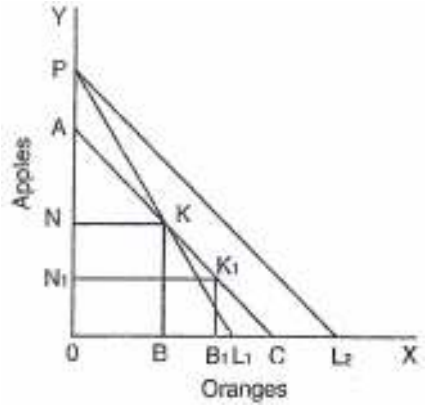


Fig. 2.8.3

It shows the consumer buys more quantity of oranges, how OPL_2, is new triangle of consumer's choice. It reveals that consumer can buy any, combination lied on PL_2 price line.

Suppose, if consumer has to buy previous combination of apples and oranges lied at point, K. Consumer's money income could be reduced to that amount equal to his rise in real income due to the fall in price of oranges. In order to do 5 so a parallel line AC is drawn to the PL_2 price line. Which passes through the point K. Price line AC shows a new triangle of choice OAC.

Now consumer can purchase all combinations lying in or on this triangle OAC. Since consumer has revealed his preference to point K on the original price line PL_1. So all points lying on KP segment will not be preferred by him. (i.e. consistency assumption). So, he rejects ali points on segment KP. Because they reveal less quantity of oranges as price is fallen. Therefore, consumer will either choose point K or any other combination below the point K on segment KC of the price line AC. Suppose consumer has choosen the combination at point K_1, it shows ON_1 apples and OB_1 oranges, i.e. he buys BB, more quantity of oranges due to fall in its price. Thus, it is clear that as price of oranges falls, demand for it rises. It shows the inverse relationship between price and demand of a commodity. Therefore demand e curve slopes downward from left to right. It proves that when income elasticity is positive, price elasticity is negative.

Criticisms :

This theory is criticized on the following grounds.

1) This theory can't consider indifference in the consumer behaviour :

It is based on strong ordering. In actual practice, when consumer chooses a point on price line, there are some points in the vincinity of that point, which consumer can choose. These points are very close to the choosen point of combination. Consumer is indifference in respect of these points. If this criticism is accepted the Samuelson's demand theorem breaks down immediately.

2) This theory is based on positive income elasticities,-doesn't distinguish between income and substitution effect :

This theory assumes positives income elasticity and negative price elasticity of demand. Income effect reveals that rise in demand due to the fali in price of a commodity. But price effect also comprises the income effect. It doesn't say how many demand is risen due to income effect and how many is due to substitution effect. It only says about the rise in total demand.

3) This theory doesn't explain the demand for Giffen goods :

Samuelson assumes the positive income elasticity of demand. It means that as income rises, demand for goods also rises and vice versa. But it doesn't say about the negative income elasticity of Giffen goods. Why demand for Giffen goods falls, as income rises.

This theory doesn't say any thing about the failure of reciprocal relationship between price and demand for Giffen goods.

4) It doesn't explains the market demand :

Samuelson's revealed preference theory gives explanation about the individual demand of a consumer, but say any thing about market demand.

5) This Theory is based on the principle that "Choice reveals preference.

This theory says that consumers choice reveals his preference. But when there are risks and uncertainties in commodity choice, consumer applies strategies like game theory. In this situation his behaviour is not normal and consistent. So, this

theory doesn't give explanation of such types of behaviour. Therefore, the principle choice reveals preference doesn't found to be true. .

2.14 Summary

Demand means the will to purchase a thing backed by money. Demand function means the relationship between the demand and factors determining it. Alfred Marshall has given law of demand which shows the inverse relationship between price and demand. Personal demand and market demand show similar inverse relationship between price and demand of a commodity. Law of demand has some limitations and exceptions as change in income, changes in tastes and preferences, change in prices of substitutes and complimentary goods. Population change etc. War, economic depression, status symbols, Giffen goods, essential goods etc.

Elasticity of demand shows the proportionate change in demand due to the proportionate change in price of a commodity. It is mathematically shown as

$$e = \frac{\Delta q}{\Delta p} \times 100 \quad \text{Or} \quad e = \frac{\Delta q}{q} \div \frac{\Delta p}{p}$$

Elasticity of demand is of 5 types as 1) perfectly elastic demand 2) perfectly in elastic demand 3) relatively elastic demand 4) relatively inelastic demand 5) unitary elastic demand.

Elasticity of demand is measured by 3 methods viz. 1) proportional method, 2) Total outlay method, 3) Geomerical method.

Elasticity of demand depends on various factors. It is useful to producers, government, in international trade, in distribution etc.

Prof. Samuelson has given the demand analysis called Revealed preference theory. By avoiding the defects in Indifference curve Prof. Samuelson has given this superior version of demand theorem. With the help of this theory Prof. Samuelson shown the inverse relationship between price and demand of a commodity.

The consumer's choice under risk explains the behaviour of consumer under the conditions of risk and uncertainty. How consumer's behaviour takes place under risky situation is explained by various economists as St. Petersburg Paradox, Neumann-Moregenstern statistical theory, Freidman-Savage hypothesis and the Markowitz Hypothesis.

Demand forecasting means prediction of future demand. It is the most important function of business manager. It is of two types, short run and long run demand

forecasting. There are main two methods of estimation of future demand as (1) survey method and (2) statistical methods. Under these two methods there are again many sub-methods of demand forecasting.

Demand forecasting is useful to business manager in various ways, viz. to take decision regarding production, to predict supply of goods, to predit price. In capital budgeting, in resource planning, to determine sales target for industrial management.

2.15 Questions For Self Study

A) Fill in the blanks.

1. Law of demand is given by .....
2. Law of demand shows ..... type of relationship between price and demand.
3. Giffen goods are ..... types of goods.
4. There are ..... types of Elasticity.
5. There are ..... methods of measurement of elasticity of demand.
6. Indifference curve is put forth by …….
7. Revealed Preference theory is given by ……

Ans. : 1) Marshall 2) Inverse 3) Inferior 4) Five
5) Three 6) J. R. Hicks and Allen 7) Prof. Samuelson

B) State True and False.

1. Concept of elasticity of Demand is given by Alfred Marshall.
2. When change in price is greater than change in demand is called less elastic demand.
3. Cross elasticity measures the relationship between the change in price and demand of substitute goods.
4. Elasticity of demand doesn't helps to producers in price fixation.
5. Demand for necessary goods in inelastic.
6. Revealed preference theory is given by Prof. Samuelson.
7. Two indifference curves never intersect each other.
8. Budget line does not mean price line.
9. Substitution effect is given by Hicks and Slutsky.
10. Demand forecasting means estimation of past demand.

Ans. : 1) True 2) True 3) True 4) False 5) True 6) True 7) True 8) False

9) True 10) False

2.16 Questions for Practice

1. State law of Demand, what are the exceptions of it ?
2. What is elasticity of Demand ? State its types.
3. Explain the methods of measurement of elasticity of demand.
4. Explain the Revealed preference theory.
5. Elucidate the theory of consumer's choice under risks.
6. What is demand forecasting ? State it's methods of estimation in brief.
7. State Least-square method of demand forecasting.
8. Explain the survey methods of demand forecasting.
9. Explain the properties of Indifference curve.
10. Explain the consumer's equilibrium with the help of indifference curve.
11. What do you mean by marginal rate of substitution.
12. **Short Notes :**
    (i) Demand Function
    (ii) Exceptions to Law of Demand
    (iii) Factors determining the elasticity of Demand
    (iv) Income elasticity of Deamnd
    (v) Cross elasticity of demand
    (vi) Applications of elasticity of demand
    (vii) Indifference curve map
    (viii) Indifference curve schedule
    (ix) Marginal Rate of Substitution.

2.17 References for more Reading

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2. Managerial Economics : H. C. Peterson and W.C. Lewis, Prentice Hall, New Delhi.
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❑❑❑

Unit-3

Theory of Production, Price Determination and Pricing Practices

Index :

3.0 Objectives

After going through this unit, you will able to know :

- The concept of production function.
- Analysis of short-run and long-run production function.
- Cobb-Douglas production Function
- Empirical evidences of cost curves
- The concept of break-even point analysis.
- Features and price determination under Monopolistic Competition
- Features and pricing under Oligopoly Market
- To study the pricing techniques.
- To study investment analysis.
- To study project appraisal methods.

3.1 Introduction

Production and consumption are the two important concepts used in managerial economics. A country's overall progress depends on these two terms. Production is the process which leads to the various forces of an economy i.e. demand, supply, profit, loss, economic growth etc. We have seen the consumer's attitude towards the demand for a commodity in the previous Unit No. 2. We have also considered the methods of demand forecasting in it. Here, we have to consider the production theory in this particular unit. We will also get the information about production function concept, economies of scale, different cost concepts and break-even point analysis in this particular Unit No. 3.

Exchange is a very fundamental department of economics. It occupies a pivotal position in the modern economy. As a matter of fact, it is market where exchange takes place. Market is generally understood to mean a particular place or locality where goods are sold and purchased. However, in economics, by the term market we do not mean any particular place or locality in which goods are bought and sold. The idea of a particular locality or geographical place is not necessary to the concept of

the market. What is required for the market to exist is the contact between the sellers and buyers so that transaction at an agreed price can take place between them. According to Cournot, "Economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same good tends to equality easily and quickly". Term Market is classified on the basis of three main elements. A) the number of firms producing a product, b) the nature the product produced by the firms and c) the ease with which new firms can enter the industry or price elasticity of demand. In present unit you will be familiarized with the term market, its different forms and price determination under different market forms.

3.2 Analysis of the Unit

Production function is an important part of managerial economics. The term production function denotes the functional relationship between the inputs used for the production process and the output. Every producer in modern times, always considers production cost, demand and other many factor while taking decisions regarding production. The detail information in respect of production function and other related terms is as under.

3.2.1 Production Function

Production function reveals the relationship between input and output under the given technology. The concept of production function is summarised an explanation of technological possibilities.

Westbrook and Tybout has given the definition of production function in 1993 as under - “the relationship between input and output flows in manufacturing is determined by the technology employed and the economic behaviour of the producer”. We can explain the concept of production with the help of following mathematical formula -

$$X = f(LKRSVY)$$

Here,

X = Output

f = Functional relationship

L = Labour

K = Capital

R = Raw material

S = Land

V = Returns to scale

Y = Efficiency parameters.

Thus, according to A. Koutsoyiannis, a production function is purely technical relationship between input factors and the output.

Nature of Production Function :

A production function is a flow concept. It relates to the flow of inputs and resulting flows of output of a commodity during a period of time. Thus the time element is an important attribute of a concept production function. We can classify this concept by the two types based on time element.

The Short-run Production Function :

The short-run production function depects the relationship of input factors to the output within a short-run period. In the short-run period of time, fixed factors of input can not be changed. This types of production function includes fixed and variable components of inputs. When we change one input factor in the production function, the output results are of three types i.e. increasing returns, decreasing returns and lastly negatively reurns.

According to Paul Samuelson, "an increase in some inputs in a given state of technology, the cause output will be increase for some time and then it decreases."

We can explain this short production function with the help of following example.

Suppose land is a fixed factor and labour is a variable factor. We can not increase the supply of land. When we change (increase) the quantity (number) of variable input (labour) in a production process, at the initial stage the production increases, then it decreases and at last it becomes negatively. We can explain short run production function with the help of production schedule shown in the Table No.3.1.

Table No. 3.1
Short-run Production Function

(Production in Quintal)

Fixed Factor (Land)	Variable Factor (Labour)	Total Production	Average Production	Marginal Production	Stage
5 Acare	1	5	5	5	(I) Increasing Returns
5 Acare	2	12	6	7	
5 Acare	3	21	7	9	
5 Acare	4	28	7	7	(II)Decreasing Returns
5 Acare	5	30	6	2	
5 Acare	6	30	5	0	
5 Acare	7	28	4	– 2	(III) Negative Returns
5 Acare	8	24	3	– 4	

Table No. 3.1 reveals the relationship between the change input factor (Labour) and the output. The table also shows us the change in a variable factor of labour to the changes in total, average and marginal production. The detail explanation of this table can be given with the help of following 3 stages.

Stage First : Increasing Returns

In the first stage is called the stage of increasing returns. The Table No. 3.1 shows us that the total, average and marginal production increases upto the appointment of 3rd labour. This is happens due to the proper utilisation of fixed factor i.e. land in the production process.

Stage Second : Decreasing Returns

In the 2nd stage of short-run function is of the decreasing returns stage. In this stage, the total production increases upto 30 quintal and then becomes constant, average production decreases from 7 to 5 quintal and marginal production decreases from 7 to 0 quintals. This is happening due to the scarcity of fixed factor (land) as compared to the variable factor i.e. labour.

Stage Third : Negative Returns

In short-run production function, the third stage is of negative return stage. In this particular stage, as per increase in variable factor i.e. labour, the total and

average production decreases from 28 to 24 and 4 to 3 quintal respectively. But one most important thing happens in this stage i.e. the negative returns of marginal production from – 2 to – 4 quintal. In this stage, fixed factor becomes inadequate in relation to variable factors i.e. labour. So that excess quantity of variable factor, the sign of negative returns have been seen in the production process.

Thus, short-run production function reveals the relationship between inputs and output in short-run period. It also gives us practical significance of agricultural sector situation.

Now we shall clear this short-run production function with the help of figure no. 3.1.

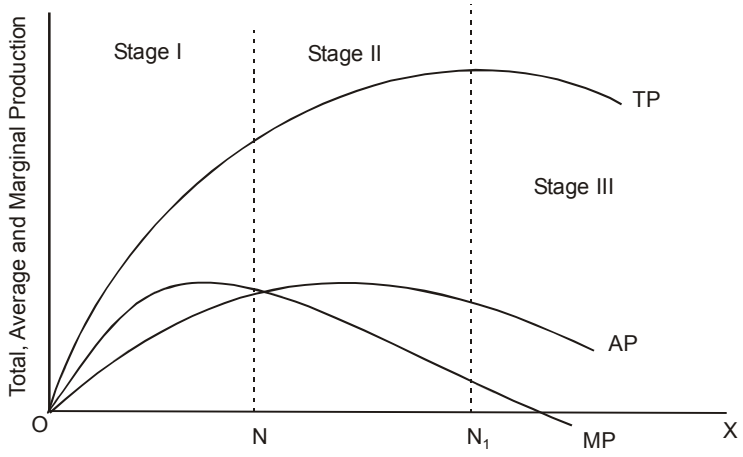


Fig. 3.1 : Short-run Production Function

Figure No. 3.1 shows us the 3 usual stages in the operation of short-run production function. Ist stage is upto the units of labour ON, second stage is from On to ON_1 and the 3rd stage is beyond ON_1. TP, AP and MP denotes the total, average and marginal production respectively.

Assumptions of Short-run Production Function

The short-run production function is based on the following assumptions.

a) The stage of technology is constant.

b) The input factor labour is variable and other factors are fixed.

c) The combination of fixed and variable factors is fixed within the short-run period.

d) The prices of variable factors are fixed within the period.

In this way, short-run production function implies the restricted set of choice which can be varied only by changing the variable factors in the production process.

3.2.3 Long-run Production Function

In the long-run period, all factors of production becomes variable. So that the relationship between input factors and production level will be differ from the short run period. Thus the long-run production function denotes the changing nature of inputs and out-put in the production process. When we increase the size of inputs, the level of production will of three main stages. i.e. increasing returns, constant returns and decreasing returns.

Explanation of Long-run Production Function :

We can explain the long-run production and the stages of it with a numerical example given below. Suppose land and labour are the two variable factors used in the production process by the organisor. When these two input factors used in the production by 1:2 ratio, the changes in the total and marginal production should be as under, shown in the Table No. 3.2

Table No. 3.2

Long-Run Production Function

Land (Acre)	Labour	Total Production (Quintals)	Marginal Production (Quintals)	Stage of Function
2	1	5	5	Increasing Returns
4	2	11	6	
6	3	18	7	
8	4	26	8	Constant Returns
10	5	34	8	
12	6	41	7	Decreasing Returns
14	7	47	6	
16	8	52	5	

Analysis of the table : The three stages shown in the Table No. 3.2 can be explained as follows.

A) Increasing Returns Stage :

In the first phase of long-run production function, we experience that as per increase in the inputs of labour and land in the 1 : 2 ratio, the total and marginal production increases by 5 quintal to 18 quintals and 5 quintals to 7 quintals respectively. This increasing trend of marginal and total production is caused by the proper use of inputs and due to the economies of scale.

B) Constant Returns Stage :

The second stage of long-run production function is of constants return stage. In this stage, when the input factors of labour and land will be increased propotionately, the marginal production becomes constant i.e. 8 quintals. The basic cause of constant returns is the ideal combination of inputs and output as well as optimum economies of scale in the production process.

C) Decreasing Return Stage :

In the third stage of long-run production function is of decreasing returns stage. In this particular stage, when inputs increases in the ratio 1 : 2, total production increases slowly from 41 quintals to 52 quintals but marginal production decreases from 7 quintals to 5 quintals. This is happens due to the diseconomies of scale in the production process. We can realise the long-run production function with help of Figure No. 3.2 given below.

Figure No. 3.2 : "Long Run Production Function'

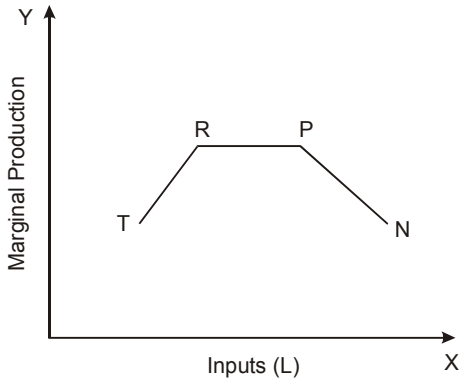


Figure No. 3.2 shows use the trends in total and marginal production as per change in the input factors of land and labour proportionately. The curve TN clears the trends in marginal production. Here we find the increasing trend upto R point. R

to P point denotes the constant returns situation and P to N stage is the third stage which is known as decreasing returns stage. In this way, long-run production function shows the relationship between inputs and output.

Thus, short-run and long-run production function is related with the relationship between input and output. This concept is always useful for industrialists and entrepreneurs while taking decisions in respect of factors of production for the production process.

3.2.4.0 Introduction :

Production is a transformation process where physical inputs are converted in physical output. In other words inputs are changed in output in the production process. For ex : Sugarcane is input for the sugar factory and this Sugarcane is converted into sugar. Thus Sugarcane is input and sugar is output. But this production takes place with the help of factors of production. The specific combination of these factors of production is required for the specific output. The output depends upon input. The functional relationship between physical input and physical output is production function.

In the last subunit of this chapter you have understand short-run production function and long run production function. In this subunit we are to discuss Cobb-Douglas Production Function, and are to understand. Assumption diagramic representation and extension of Cobb-Douglas Production Function.

3.2.4.1 Cobb-Douglas emperial Study :

This production function was proposed by knut wicksell (1851-1926). It was tested against empirical statistical evidence of American manufacturing industry by charles Cobb and Paul Douglas in between 1899-1922. It is a linear homogeneous production function of first degree. The two inputs labour and Capital were taken into account. It was found 75% increase in manufacturing production was beacuse of labour input and remaining 25% was due to capital input.

3.2.4.2 Formula :

The mathematical fermula of Cobb-Douglas is given below,

$$P(L, K) = bL^{\alpha} K^{\beta}$$

where : B P = total productin (the monetary value of all goods produced in a year)

B L = labor input (the total number of person-hours worked in a year)

B K = capital input (the monetary worth of all machinery, equipment and buildings)

B b = total factor productivity

B a and b are the output elasticities of labour and capital, respectively. These values are constants determined by available technology.

Output elasticity measures the responsiveness of output to a change in levels of either labour or capital used in production, ceteris paribus. For example if a = 0.15, a 1% increase in labour would lead to approximately a 0.15% increase in output.

Further, if :

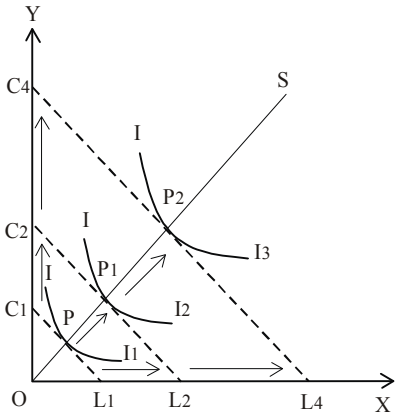
$\alpha + \beta = 1$,

the production function has constant returns to scale. That is, if L and K are each increased by 20%, then P increases by 20%.

Thus output will increase in the same proportion. It is constant returns to scale.

3.2.4.3 Diagramic Representation :

Cobb-Douglas Production Function can be explained with following diagram.



Input cambitation	output IIQ curve
OL_1 Labour + OC_1 Capital =	II_1
OL_2 Labour + OC_2 Capital =	II_2
OL_4 Labour + OC_4 Capital =	II_3

In the above diagram Labour inputs are measured on ox axis and capital inputs are measured on oy axis. OL_1 units of labour and OC_1 units of capital are producing 50 units of output. If the output is to be increased twice, i. e. 100 units then both inputs labour and capital have to be increased two time i. e. OL_2 and OC_2. Thus L_1,C_1 factor combination gives II_1, Isoquant of 50 units of output and OL_2OC_2 factor

combination gives increased II_2 Isoquant of 100 units of output. When OS is scale line the Isoquants II_1, II_2 Isoquants are on equal distance. i.e. on OS scale line OP = PP1. In brief the increase in labour and capital results in proportionate increase in output.

3.2.4.4 An Example :

Economic Data of American Economy used for analysis is given below in Table No. 1.

Table No. 1 : Economic Data of American Economy

Year	1899	1900	1901	1902	1903	1904	1905	...	1917	1918	1919	1920
P	100	101	112	122	124	122	143	...	227	223	218	231
L	100	105	110	117	122	121	125	...	198	201	196	194
K	100	107	114	122	131	138	149	...	335	366	387	407

Table No. 1 : Economic data of the American economy during the period 1899-1920 (1). Portions not shown for the sake of brevity.

Using the economic data published by the government, Cobb and Douglas took the year 1899 as a baseline and *P, L* and *K* for 1899 were each assigned the value 100. The values for other years were expressed as percentages of the 1899 figures. The result is Table No. 1.

Next, Cobb and Douglas used the method of least squares to fit the data of Table 1 to the function :

$$P(L, K) = 1.01\ (L^{0.75})\ (K^{0.25})$$

For example, if the values for the years 1904 and 1920 were plugged in :

$$P(121, 138) = 1.01\ (121^{0.75})\ (138^{0.25}) \qquad 126.3$$

$$P(194, 407) = 1.01\ (194^{0.75})\ (407^{0.25}) \qquad 235.8$$

which are quite close to the actual values, 122 and 231 respectively.

The production function $P(L, K) = bLa\ Kb$ has subsequently been used in many settings, ranging from individual firms to global economic questions. It has become known as the **Cobb-Douglas production function.** Its domain is $\{(L, K) : L \underline{h} O, K \underline{h} O\}$ beacuse *L* and *K* represent labour and capital and are therefore never negative.

3.2.4.5 Assumptions :

The assumptions taken by Cobb and Douglas are as follows :

1. If either labor or capital vanishes, then so will production.
2. The marginal productivity of labour is proportional to the amount of production per unit of labor.
3. The marginal productivity of capital is proportional to the amount of production per unit of capital.

3.2.4.6 Properties of Cobb-Douglas Production Function :

For emperical research the several properties of Cobb-Douglas Production Function are helpful which are discussed below.

The multiplicative form of the power function can be changed in to log-linear form as below.

$$\log Q = \log A + a \log K + b \log L$$

The degree of homogenity is determined by the sum of the exponents a and b. If a+b = 1, it implies hamogenous production function of First degree and constant returns to scale.

a and b represents the elasticity of co-efficient (E) of altput for inputs K and L respectivy. This Co-efficient is proportional change in output to a given change in input either K or L.

$$E_K = \frac{\partial Q/Q}{\partial K/K} = \frac{\partial Q}{\partial K} \cdot \frac{K}{Q}$$

$$E_L = \frac{\partial Q/Q}{\partial L/L} = \frac{\partial Q}{\partial L} \cdot \frac{L}{Q}$$

Contant a and b represent the relative distributive share of inputs K and L in total output Q. Which can be obtained as.

$$\frac{\partial Q}{\partial L} \cdot K \frac{1}{Q} = \frac{aAK^{a-1}L^b.K}{AK^aL^b} = a$$

In its general form Cobb-Dauglas Production function implies at zero cost there will be zero production.

3.2.4.7 Cobb-Douglas Production Function in the extended form :

This Production Function can be extended to more than two factors. In agriculture along with labour and capital other inputs like Irrigation, fartilisers, land are used. So the Cobb-Douglas Production Function in extended form can be represented in following formula.

$$Q = AL^{a}K^{b1}D^{b2}G^{b3}F^{b4}$$

Whre Q stands for output, L and K stands for labour and Capital respectively, a and b are exponents of labour and capital respectively, D stands for land G stands for irrigation, F stands for fertiliers and b2, b3, b4 are exponents of land, irrigation and fertilisers respectively.

3.2.4.8 Criticisms on Cobb-Douglas Production Function :

Economist like Arrow, Chenery Minhas and Solow have criticised the Cobb-Douglas Production Function.

1) C-D Production function takes into account only two inputs - labour and capital.
2) It has taken into account full use of available capital which is made in unrealistic situation of full employment.
3) It implies constant returns to scale which is not found. Instead there is either increasing or decreasing returns to scale.
4) This function has taken the unrealistic assumption of perfect competion.
5) This function has neglected complementarity of factors and assumed substitutability of factors.
6) The major problem with this production function is of aggregation. This function has been applied to entire industry. In reality there will be many production functions in different firms, industries.

Despite these criticism, the Cobb-Douglas production function has been widely used in emperical studies of manaufacturing industries and far compartive studies.

3.2.5 Empirical Evidences of Cost Curves

Introduction :

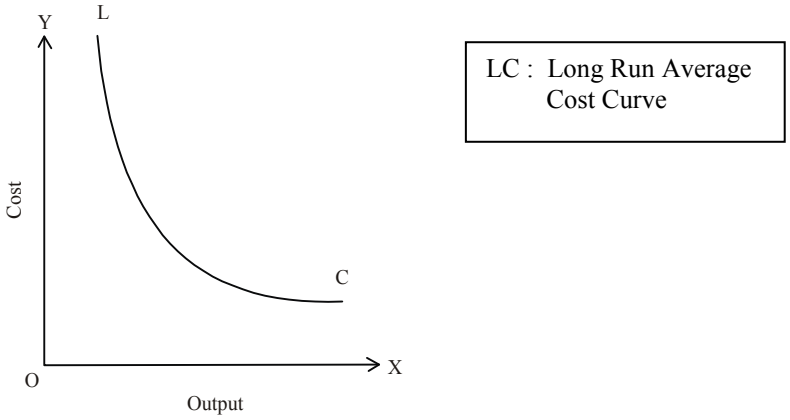
Production Cost is one of the aspeect which determines the supply of goods and services. The cost of the Production changes with the change in the output of the firm. For profit maximisation every firm chooses least cost combination of factors.

L - Shaped Long Run Average Cost Curve :

In the cost theory, thre is recent development that, the long run average cost curve is L - shaped instead of U - shaped. It means that when a firm increases its output its cost per unit decreases because of economies of scale. The long run average cost curve not rises eventhough there is increase in production. It remains constant or slightly falls. The managerial cost per unit of output may increase at a very large scale of production but the technical economies more than offset the managerial diseconomies. Therefore the total long-run average cost does not rise. So in recent years the economists are of the opinion that U - shape in the longrun average cost curve does not occur. Empirical evidence indicates that the long-run average cost rapidly decreases but after a point it remains flat through out or at its right-hand end it may downward sloping.

The L - shaped long run average cost curve is shown in the following diagram

L - shaped Long-Run Average Cost



There is contradiction between traditional economic theory and modern economic theory. Traditional economic theory states that Long-Run Average Cost Curve is U - shaped and the modern economic theory explains that Long-Run

Average Cost Curve is L - shaped. Two reasons are given for the explanation of L - shape of Long run average cost curve. First reason is that a firm continues to enjoy some technical economies even after a minimum optimal scale is reached. Second reason is that the modern developments in managerial science ensuring optimal managerial set up for a Larger scale of production prevents the longrun average cost to rise.

3.5.2 L - Shaped Lon Run Average Cost Curve and Empirical Evidences :

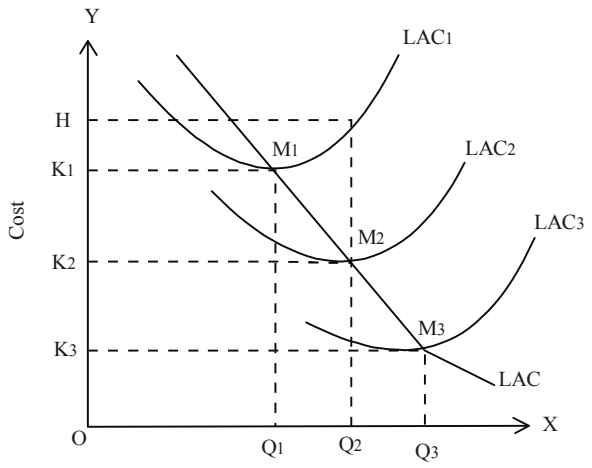
The following two explanations have been provided for the occurance of L - shaped longrun cost curve.

1) Technical Progress :

Traditional economic theory assumes that there is no change in technological progress but in real sense technological progress takes place over a period of time. Due to this, long run average cost curve shifts downward.

This is shown in the following diagram

Downward Slopirn Long Run Average Cost Curve



LAC : Long Run Average Cost Curve

In the above diagram it is shown that initially the firm is producing output OQ_1 at average cost OK_1 and the long run average cost curve is LAC_1. If the demand of firms product increases, then the firm increase its output upto OQ_2 then in the context of unchanged technology the firm will expand production along LAC_1 and will produce OQ_2 output at average cost OH. If the technological progress has taken place, with new technology the firm will produce on the new curve LAC_2 with output

OQ_2 at OK_2 cost per unit which is less then both OK_1 and OH. Further if the firm increases output to OQ_2 and meanwhile the technology might have advanced then the firm produces OQ_3 at OK_3 cost per unit which is less than OK_2. After joining the minimum points M_1, M_2, M_3 of long run cost curves i. e. LAC_1, LAC_2, LAC_3 we can get a curve LAC (Long Run Average Cost Curve) which is downward sloping due to technological progress whereas with unchanged technology long run average cost curves LAC_1, LAC_2 and LAC_3 are U - shaped.

Therefore, empirical studies made by modern economists suggests that with an unchanged technology, long - run average cost curves are U - shaped and due to technological progress long - run average cost curve is L - shaped.

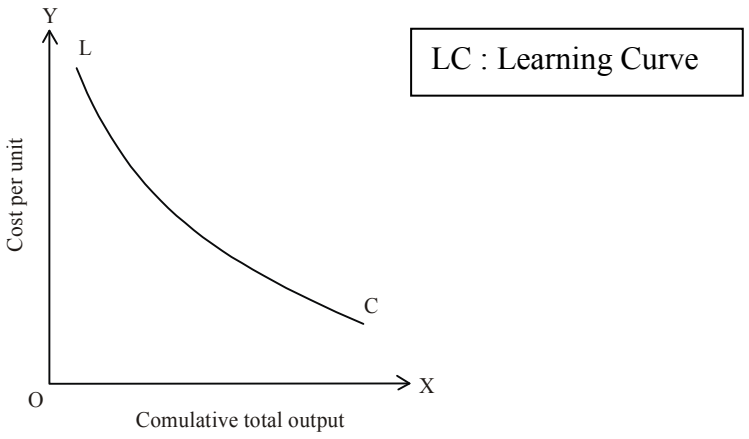
2) Learning by Doing :

The another reason of downward long-run average cost curve is learning by doing. When a firm increases its output overtime, it learns to produce it more efficiently because greater the experience, the firm produces its output in a better way than before and thus the cost per unit decreases.

Empirical evidence proves that the firm's production cost not-only depends upon the amount of output of a commodity it produces but also on the aggregate amount of that commodity produced since the time it started its production. This is because the aggregate output by a firm determines the degree of learning it has acquired and the efficiency gained by it.

The learning curve is shown in the following diagram

Learning curve



In the above diagram on the X - axis cumulative total output over successive periods of time and on the Y - axis cost per unit of output are measured. The above diagram shows that the learning curve slopes downward, it means cost per unit of output decreases as cumulative output increases over a time and the firm learns from its wok experience.

Thus as the aggregate amount of output produced bya firm increases over time, the cost per unit goes on decreasing. This is because when the firm produces more production, it learns to produce it more efficiently so the cost per unit decreases. It should be noted that with the increase in aggregate production of a commodity overtime, learning gained by a firm is not only in rrespect of improvement in efficency in the production but also in respect of improving the organisation of the firm.

Thus, technological progress and learning are the reasons why the long-run average cost curve is L - shaped rather than U - shaped.

3.2.6 Break Even Analysis

The concept of break even analysis or point is important for the stabilisation of business now-a-days. Break even analysis is a technique which shows the relationship between the production cost and revenue of a firm with its volume. Now-a-days every firm or businessman uses this technique for the maximisation of output with a least costs for getting maximum profit. The break even analysis also indicates the level of output or sale and the revenue earned by a firm. When a businessman has become successful to make ideal combination or equilibrium between the costs, revenue and output at higher level, the position will be most profitable to him. Thus break even point analysis is used for the optimum level of production and sales of a firm. The formula of break even point or analysis is as under

$$\text{BEP} = \frac{\text{TFC}}{\text{P}-\text{AVC}}$$

where, BEP = Break Even Point

TFC = Total Fixed Cost

P = Selling Price of a Commodity

AVC = Average Variable Cost

P – AVC = Profit margin per unit

Now we will see the concept of break even analysis with the help of following Figure No. 3.4.

Figure No. 3.4

"Break Even Point Analysis"

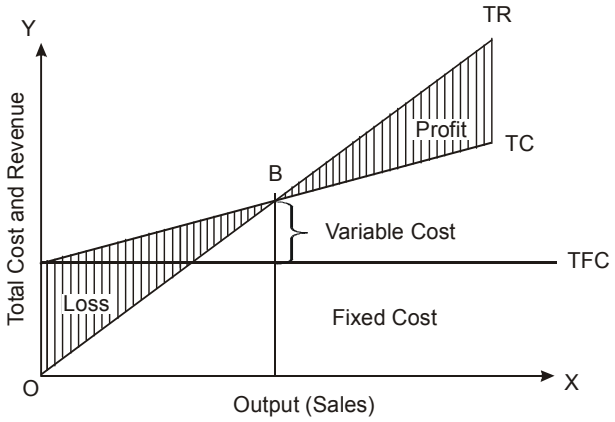


Figure No. 3.4 shows us the break even point. OX axis clears the output or sale sof a firm whereas OY axis depects total cost and total revenue. 'B' is the point at which total revenue and total cost are equal whichis known as no profit no loss i.e. break even point. Here we also find that, before point 'B', a firm or business is in losses and beyond 'B' point represents the profit of the firm. Thus 'B' point (break even point) is an excellent instrument for the guidance to the business manager in the determination of profitable output and how to control the business.

3.2.7 Meaning of Price Discrimination

Price discrimination means it is the practice of seller that different consumers are being charged by different prices for the same product or service. Specifically, those who are willing to pay more will be charged a higher price, whereas price-sensitive individuals will be charged less.

Prof. Stigler defines price discrimination as "the sale of technically similar products at prices which are not proportional to their marginal costs."

Prof. Mrs. Joan Robinson defines it as "charging different price for the same product, or same price for the differentiated product"

A Cricket fan will pay any price to get Tendulkar's signed t-shirt while another person would feel indifferent about it. Seller of t-shirt will get more money selling the signed t-shirt of Tendulkar to a super fan than a person with no interest in Cricket. Basically, the goal of price discrimination is to capture more of the consumer surplus and maximising Producer's surplus.

3.2.7.1 Price discrimination types

Price discrimination may be personal, local, or according to trade or use. According to Prof. A. C. Pigou, there are degrees of Price discrimination, which can be classified into three types: first-degree price discrimination, second-degree price discrimination, and third-degree price discrimination (look at table given below).

Types of price discrimination	**First degree**	**Second degree**	**Third degree**
Price company charge.	Maximum willingness to pay	Based on the quantity used.	Based on customer background

First- Degree Price discrimination

First-degree price discrimination is also known as perfect price discrimination. In this type of discrimination, producers charge their customers the maximum amount they are willing to pay and capture the entire consumer surplus.

Second-degree price discrimination

Second-degree discrimination happens when the company charges prices based on the amounts or quantities consumed. A buyer making bulk purchases will receive a lower price compared to those purchasing a small quantity.

A well-known example is the phone service. Customers are charged different prices for the number of days and mobile data they use

Third-degree price discrimination

Third-degree price discrimination occurs when the company charges different prices for customers from different backgrounds or demographics.

Museums charge adults, children, students, and the elderly differently for their ticket.

Another example of price discrimination is Railway tickets. The tickets usually have different prices depending on the urgency of consumer's travel. When bought in advance, railway tickets are typically much cheaper than those bought 'Tatkal' on the day of travel.

3.2.7.2 Conditions for price discrimination

Here are some of the conditions for price discrimination to occur:

- **A degree of monopoly power:** The seller must have sufficient monopoly power in order to price discriminate. In other words, it needs to be a price maker capacity.
- **The ability to define customer segments:** The seller must be able to separate the market based on customers' needs, characteristics, time, and location.
- **The elasticity of demand:** The consumers must have different elasticity of demand. For example, demand for air travel from low-income consumers is more price elastic. In other words, they will be less willing to travel when the price increases compared to wealthier people.
- **Prevention of re-sale:** the company must be able to prevent its products from being resold to the another group of customers.

Price discrimination is also possible in the following cases.

1. The nature of good.
2. Tariff barriers and long distance.
3. Legal sanction.
4. Buyers' preference or prejudices.
5. Buyers' ignorance or laziness.

3.2.7.3 Dumping

Dumping is an international price discrimination in which an exporter firm sells a portion of its output in a foreign market at a very low price (competitive price) and the remaining output at a high price in the home market (Monopoly Price). **Haberler** defines dumping as: "The sale of goods abroad at a price which is lower than the selling price of the same goods at the same time and in the same circumstances at

home, taking account of differences in transport costs" **Jacob Viner's** definition is simple, as per him dumping means"price discrimination between national markets"

3.2.7.4 Types of Dumping

Dumping can be classified in the following three ways:

A. Sporadic or Intermittent Dumping:

It is so happens some time that when the domestic production of the commodity is more than unsold stocks of the commodity even after sales. In such a situation, the producer sells the unsold stocks at a low price in the foreign market without reducing the domestic price. But this is possible only when foreign demand for his commodity is elastic and the producer is a monopolist in the domestic market. The basic aim of seller is to identify his commodity in a new market or to establish himself in a foreign market to drive out a competitor from a foreign market. In such case of dumping, the producer sells his commodity in a foreign country at a price which covers his variable costs and some current fixed costs in order to reduce his loss.

B. Persistent Dumping:

Persistence Dumping means it is the case, where monopolist continuously sells a portion of his commodity at a higher price in the domestic market and the remaining output at a lower price in the foreign market. This situation may happen because the domestic demand for that commodity is less elastic and the foreign demand is highly elastic. Suppose costs is falling continuously along with increasing production, the producer does not wants to lower the price of his product in the domestic market because demand is less elastic in the home market.

However, if demand is highly elastic for his product he keeps a lower price in the foreign market. As a result of this, he can earns more profit by selling more quantity of the commodity in the foreign market. Hence, the foreign consumers gets more benefit from it because they are required to pay is less price than in the absence of dumping.

C. Predatory Dumping:

The predatory dumping means when a monopolist firm sells his commodity at a very lower price or at a loss in the foreign market in order to drive out some competitors. But when the competitors disappears from the market, he raises the

price of the commodity in the foreign market. Thus, the firm covers loss and if the demand in the foreign market is less elastic, his profit may rise.

3.2.7.5 Objectives of Dumping:

The main objectives of dumping are as follows:

1. To get a space in the Foreign Market:

A monopolist follows dumping in order to find a place or to stay in the foreign market. If there is a perfect competition in the foreign market, he may lower the price of his commodity in order to increase the demand for his commodity. For this, he often sells his commodity at a lower price by incurring loss in the foreign market.

2. To sell Surplus Commodities:

When a monopolist's generates excess production of his commodity and he is not able to sell in the domestic market, he wants to sell the surplus production at a very low price in the foreign market. But it happens occasionally.

3. To Expand Industry:

A monopolist also resorts to dumping for the expansion of his industry. When he expands it, he receives both internal and external economies which lead to the application of the law of increasing returns. Consequently, the cost of production of his commodity is reduced and by selling more quantity of his commodity at a lower price in the foreign market, he earns larger profit.

4. To create a New Trade Relations:

The monopolist practices dumping in order to develop new trade relations with foreign countries. In the view of this, he sells his commodity at a low price in the foreign market, whereby establishing new market relations with those countries. In additions to this, the monopolist increases his production, lowers his costs and earns more profit.

3.2.7.6 Price Determination under Dumping:

The price is determined under Dumping is just like a discriminating monopoly. The basic difference between the two is that under discriminating monopoly both markets are domestic, while under dumping one is a domestic market and the other is

a foreign market. In case of dumping, a monopolist sells his commodity at a high price in the domestic market and at a low price in the foreign market.

Price determination under dumping is based on the following conditions or assumptions:

1. The main aim of the monopolist is to maximise his profit. He, therefore, produces that output at which his marginal revenue equals marginal cost. Since he sells his commodity in the domestic market and the foreign market separately, he adjusts the quantity in such way in each market that marginal revenues in both markets are equal.

Given the marginal cost of producing the commodity, the most profitable monopoly output will be determined at a point where the combined marginal revenue of both the markets equals the marginal cost. In other words, dumping profit = $MR_H + MR_F = MC$.

2. The elasticity of demand must be different in the two markets. The demand should be less elastic in the domestic market and perfectly elastic in the foreign market. As a result, the monopolist sells his commodity at a low price in the foreign market and at a high price in the domestic market. Thus, the price and MR are related to each other which could be explained with the following equation:

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

Where e = refers to the elasticity of demand.

AR= Average Revenue/ P= Price

MR= Marginal Revenue

3. The foreign market should be perfectly competitive and the domestic market should be a monopolistic competition
4. The buyers in the domestic market cannot buy the cheap commodity from the foreign market and bring it in the domestic market.

Explanation

Given the conditions, price and output under dumping will be determined by the equality between the total marginal revenue curve and the marginal cost curve of

producing the commodity. Fig-3.2.1 illustrates that price-output determination under dumping.

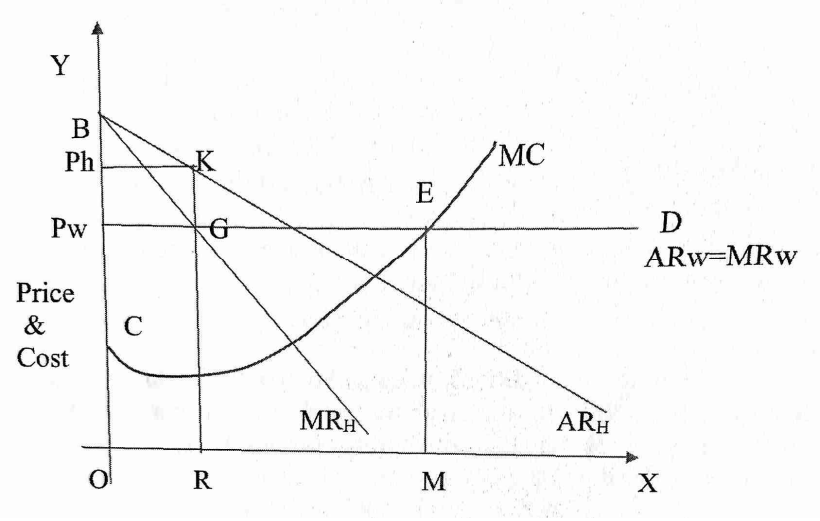


Fig-3.2.1

A special case of Price Determination may take place when a producer is selling his product in two markets, one in which he faces perfect competition, where the demand curve for his product will be perfectly elastic, while in the other he has monopoly market, where the demand curve for his product will be sloping downwards. The Equilibrium in such situation can be shown with the help of Fig-3.2.1.The foreign market demand curve faced by the monopolist is the horizontal line $\mathbf{P_wD}$ which is also called the *AR=MR* curve because the foreign market is assumed to be perfectly elastic. The demand curve in the home market with a less elastic demand for the product is the downward sloping curve AR_H and its corresponding marginal revenue curve is MR_H. The lateral summation of MR_H and P_wD curves leads to the formation of BGED as the combined marginal revenue curve. In order to determine the quantity of the commodity produced by the monopolist, we take the marginal cost curve MC. E is the equilibrium point where the MC curve equals the combined marginal revenue curve BGED. Since the marginal cost, intersect total marginal curve BGED at point E and equilibrium position is determined. Thus, OM output will be produced for sale in the two markets in such a way that MR in each market is equal to each other and to the marginal cost ME. It is clear from Fig-3.2.1 that when

amount *OR* is sold in the market, the marginal is *RG*/OP_w equal to marginal cost *ME*. Hence, total output *OM,* amount OR is sold in home market. The curve **ARh** indicates that Price *OPh* /KR wil be charged in the home market. Remaining the amount RM will be sold in the foreign market at ***RG*/OP$_w$** or Area **CEGB** represent the total profits earned by both the market. When a producer charges a lower price in the world market then in the home market, is said to be dumping in the world market.

3.2.7.7 Effects of Dumping:

Dumping affects both the importer as well as exporter of the countries in the following ways:

1. Effects on Importing Country:

The effects of dumping on the home as well as foreign country, depends up on whether dumping is for a short period or a long period, the nature of the product and the aim of dumping.

1. If a producer dumps his commodity abroad for a short period, then the industry of the importing country is affected for a short period. But due to the low priced dumped commodity, the industry of the dumping country has to incur a losses for some time because less quantity of its commodity is being sold.

2. The Dumping is harmful for the importing country, if it continues for a long period. This is because it takes time for changing production in the importing country and its domestic industry is not able to face the competition. But, when cheap imports stop or dumping does not exist, it becomes difficult to change the production again.

3. If the dumped commodity is a consumer good, the demand of the people in the importing country will change for the cheap goods. When dumping stops, this demand will reverse, thereby changing the tastes of the people which will be harmful for the home economy.

4. If the dumped commodities are cheap capital goods, it will leads to the setting up of a new industry in home country. But in case the imports of such commodities stops, the industry depending on imported goods will be shut down. Thus finally, the importing country will come under loss.

5. If the monopolist dumps the commodity for removing his competitors from the foreign market, the importing country gets the benefit of cheap commodity in the

beginning. But when competition ends and he sells the same commodity at a higher price, the importing country incurs a losses. Now they have to pay a higher price.

6. If a tariff duty is imposed to force the dumper to equalise prices of the domestic and imported commodity, it will not benefit the importing country.

7. The lower fixed tariff duty benefits the importing country, if the dumper delivers the commodity at a lower price.

2. Effects on Exporting Country:

Dumping affects the exporting country in the following ways:

1. When domestic consumers buys the commodity at a high price when the dumping executes by domestic producer, there will be loss in their consumers' surplus. But if a monopolist produces more commodities in order to dump it in another country, consumers gets benefit. This could be possible if producer undertakes more production of the commodity to mower the marginal cost. As a result, the price of the commodity will be less than the monopoly price without dumping.

But this lower price than the monopoly price depends upon the law of production under which the industry is operating. If the industry is producing under the law of diminishing returns, the price will not fall because costs will increase and so will the rise in the price.

The consumers will be losers and the monopolist will gainer. There will be no change in price under fixed costs. It is only when costs fall under the law of increasing returns that both the consumers and the monopolist will benefit from dumping.

2. The exporting country also benefits from dumping when the monopolist produces more commodity. Consequently, the demand for the required inputs such as raw materials, etc. for the production of that commodity increases, thereby expanding the means of employment in the country.

3. The exporting country earns foreign currency by selling its commodity in large quantity in the foreign market through dumping. As a result, its balance of trade improves.

3.2.7.8 Anti-Dumping Measures:

The following measures are adopted to stop dumping:

a. Tariff Duty:

The importing country imposes tariff on the dumped commodity as a result, the price of the importing commodity increases and the fear of dumping ends. But it is necessary that the rate of duty on imports should be equal to the difference between the domestic price of the commodity and the price of the dumped commodity. Generally, the tariff duty is imposed more than this difference to end dumping, but it will create a harmful effects on other imports.

b. Import Quota:

Import quota is another measure to stop dumping. Under this a commodity of a specific volume or value is allowed to be imported into the country. For this purpose, it includes the imposition of a duty along with fixing quota, and providing a limited amount of foreign exchange to the importers.

c. Import Embargo:

Import embargo is an important retaliatory measure against dumping. According to this, the imports of certain or all types of goods from the dumping country are banned.

d. Voluntary Export Restraint:

To restrict dumping, developed countries enter into bilateral agreements with other countries from which they fear dumping of commodities. These agreements ban the export of specified commodities so that the exporting country may not dump its commodities in other country. Such bilateral VER agreements exist between India and EU countries in exporting Indian textiles.

Conclusion:

Price discrimination is nothing but practice of discriminating monopoly in home market and dumping in world market.

According to Article IV of GATT 1984, which now forms part of the World Trade Organisation (WTO), a country can adopt anti-dumping measures only if the dumped imports "injure" the industry of the country. A commodity is regarded as dumped which is exported to the other country at a value lower than its normal value, or it will also be regarded as dumped if the export price of the commodity is less than its comparable price for final consumption in the exporting county. Under these situations, the importing country can impose anti-dumping duty, provided the margin

of dumping is more than 2% of the export price or is more than 7% of the dumped import.

3.2.8 Monopolistic Competition

The concept of imperfect competition is closely associated with the name of Mrs. John Robinson. As a matter of fact, perfect competition and perfect monopoly are the two extreme market forms. Though these two extremes are theoretically important, in practice, they do not actually exist. The realistic market model lie somewhere in between these two extreme market forms. However, the cases lying in between these two extremes differ from each other in relative strength of monopoly and competitive elements, or in other words, in degrees of imperfection.

Monopolistic competition signifies a market situation in which there is a large number of firms whose outputs are close but not perfect substitutes. Product differentiation is the main feature of monopolistic competition. Every producer under this market tries to maximize his sales by incurring more and more selling costs. Different firms are having independent price policies. In other words we can say, "Monopolistic Competition is condition of market in which there exist many sellers of differentiated but close substitute products having no control over price".

Characteristic features of Monopolistic Competition :

1. **Large Number of Firms :** Under monopolistic competition, the number of firms is fairly large. Large number is suggestive of the fact that the contribution of an individual firm with regard to the total demand for the commodity is not very significant. Because of product differentiation, each firm follows, to some extent, independent price-output policy. Each seller shares only a small part of the market supply. Given these features, no single seller can influence the market price by changing his supply. Therefore, seller is a price-taker.

2. **Number of Buyers :** The number of buyers is vary large, so large that no single buyer, by his individual or collective action with other buyers, can influence market price by changing demand. This is because the demand of a single buyer is a very small part of the total demand in the market. The analogy of an atom can be used to indicate this share. Hence, it is beyond the power of a single buyer to influence market price. Consequently, he has to accept the market price as given and adjust his demand to it. The buyer is a price-taker in this market.

3. Product Differentiation : Under Monopolistic competition, the products of different sellers are differentiated on the basis of brands. These brands are generally so much advertised that a consumer starts associating the brand with a particular manufacture and type of brand loyalty is developed. Product differentiation gives rise to an element of monopoly to the producer over the competing product. As such, the producer of an individual brand can raise the price of his product knowing that he will not lose all the customers to other brands because of absence of perfect substitutability. Since, however, all the brands are close substitutes of one another, the seller will lose some of his customers to his competitors. Thus this market is a blend of monopoly and perfect competition.

4. Knowledge of Market : Both the buyers and sellers have imperfect knowledge of the market because of attachment to the specific brands and to the specific sellers. Buyers do not bother to know about the substitute brands as well as other sellers even next door.

5. Non-price competition : In this marker, sellers try to compete on the basis of other than price, as for example aggressive advertisement, product development, better distribution arrangements, efficient after-sales service, and so on. A key base of non-price competition is a deliberate policy of product differentiation. Sellers attempts to promote their products not by cutting prices but by incurring high expenditure on publicity and advertisement and other sale promoting techniques mentioned above.

6. Freedom for Entry and Exit : The firms can easily enter or leave the monopolistically competitive industry without any entrance or leave the monopolistically competitive industry without any difficult I the long run.

7. Slope of Demand Curve : Under monopolistic competition, because of product differentiation, the seller has some degree of control over the price he charges and thus faces a negatively sloped demand curve. However, the existence of many close substitutes severely limits the sellers 'monopoly' power and results in a highly elastic demand curve.

Monopolistic competition

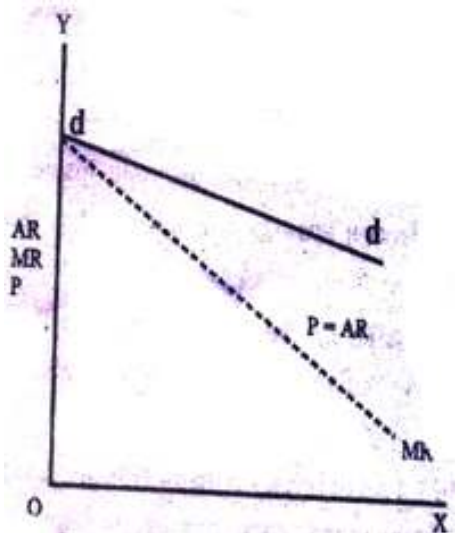


Diagram No. 3.5

The demand curve is highly elastic at the level of going market price. It is negatively sloping and represents price and AR. MR Curve lies below it.

Price and Output Determination under Monopolistic Competition :

Under the monopolistic competition, individual firm's market is isolated to a certain degree from those of its rivals with the results that its sales are limited and depend upon its price, the nature of its product and the advertising outlay it makes. Thus, the firm under monopolistic competition has to confront a more complicated problem than the perfectly competitive firm. The demand curve as seen on the monopolistic competition is negatively sloping. Since the various firms under this market produce products which are close substitutes of each other, the position and elasticity of the demand curve for the product of any the them depends upon the availability of the competition substitutes and their prices. Profits will be maximized when marginal revenue (MR) is equal to marginal cost (MC). So long as the marginal revenue is greater than the marginal cost, the seller will find it profitable to expand his output; and if the marginal revenue is less than the marginal cost, obviously it is to his advantage of reduce his output to the point where marginal revenue is equal to marginal cost.

Short-run Equilibrium : In the short-run, therefore, the firm will be in equilibrium when it is maximizing its profits, i.e., when MR = MC.

Short-run Equilibrium

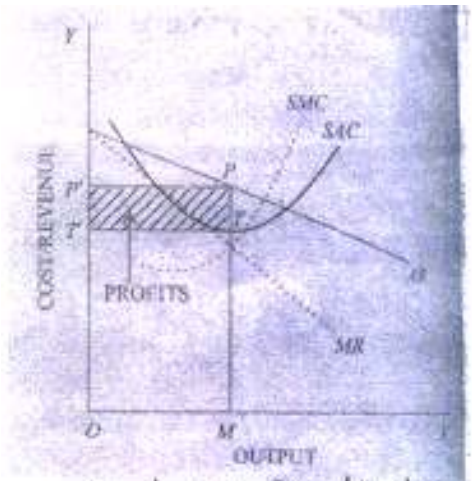


Diagram No. 3.6

In the above diagram,

AR = Average Revenue

MR = Marginal Revenue

SAC = Short-run Average Cost Curve

SMC = Short-run Marginal Cost Curve

MR and SMC intersect each other at the output OM at which price is OP1 (=MP), because P is point on AR i.e. price.

The firm is earning supernormal profits. Supernormal profit per unit of output is the difference between average revenue and average cost at the equilibrium point.

Here, MP = Average Revenue

MT = Average Cost

PT = profit per unit

So, PTT1P1 = Total profit (Output multiplied by profit per unit of output)

Competition : Short-run (with Losses)

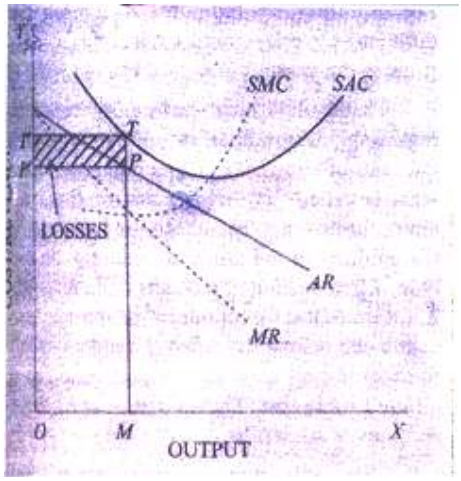


Diagram No 3.7

In the above diagram,

AR = Average Revenue

MR = Marginal Revenue

SAC = Short-run Average Cost Curve

SMC = Short-run Marginal Cost Curve

MR and SMC intersect each other at the output OM at which price is OP1 (=MP), because P is point on AR i.e. price

Here, OP1 = Price (=MP)

OP1< MT (Price < Average Cost)

TP = loss per unit of the output OM (=PP1)

Hence, TPP1T1 = Total loss

Long-run Equilibrium of Firm and Group Equilibrium:

We have now to explain how the equilibrium adjustment of prices and outputs of firms whose products are close substitutes comes about. Each firm within a group has monopoly of its own particular products, yet its market is interwoven with those of his competitors who produce closely related products. The price and output decisions of a firm will affect his rival firms who may in turn revise their price and output policies. This dependence of the various producers upon one another is a

prominent feature of monopolistic competition. When the new firms enter in the industry and start production, supply will increase and the price will fall. So, average revenue curve faced by the firm will shift to the left, and, therefore, the supernormal profit will be competed away and the firms will be earning only normal profits. If, in the short-run, firms are realizing losses, then, in the long-run, some firms will leave the industry so that the remaining firms will be earning normal profits.

In the long-run, AR curve will be more elastic, since large number of substitutes will be available in the long run. Therefore, in the long-run,equilibrium is established when firms are earning only normal profits.

Condition of Equilibrium:

Output at which MR = MC and AR = AC

Monopolistic Competition : Long-run

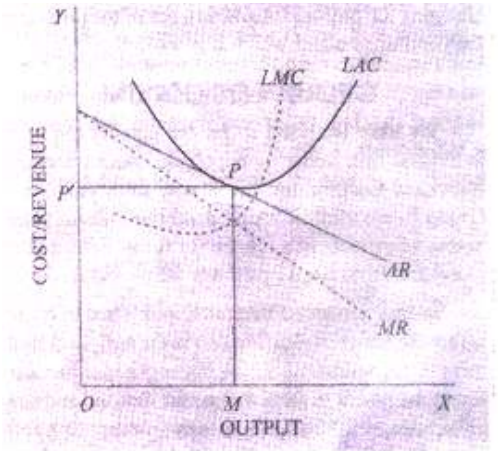


Diagram No. 3.8

In the above diagram,

AR = Average Revenue curve which is tangent to the average cost curve (LAC) at P.

Therefore, the equilibrium output in the long run is OM.

OP1 (=MP) = Price

P = Equilibrium point where Average cost is MP and so is average revenue.

Therefore, there are no supernormal profits; there are only the normal profits which form part of the cost of production.

Non- Price Competition and Equilibrium :

Non-price competition is an important feature of monopolistic competition. There are two main factors for the non-price competition, firm can compete with a) product differentiation and b) Selling cost.

A) Product Differentiation :

Though in the long run a firm under monopolistic competition gets normal profit, it has to continuously make efforts to maximize its profit. In the short run, the firm has chances to get excess profit. For this, the firm adopts the course of 'product differentiation'. The firm in reality rarely uses price as a means of market competition. Rather, it finds that non-price factors, which helps in differentiating the product, are more useful and revenue generating. "Product differentiation refers to the measures adopted be sellers under monopolistic competition to create demand for their product".

Let suppose that the price is determined at the market and the firm accepts it as such. But a firm under monopolistic competition does have a freedom to vary the quality or the design of the product. A firm my therefore try to increase and to maximize its profits through product differentiation. Seller can differentiate the product with various methods, those methods are as follow:

1. Product improvement : The qualitative improvement in the product is one of the measures to improve the product. This is done by using better material, improvement in workmanship, increased utility and efficiency of the machines, new uses of the product, systematic and attractive packing, and making available smaller sized packs and so on. Such measures help in increasing product demand.

2. Product distinction : In order to create a distinct image of the prodct in the eyes of the prospective customers, every firm resorts to various measures of superficial nature. Producer can differentiate their product with different colors, new facilities in the products, new contents in the products, better performance of the product etc. Similarly, we get attached to specific sellers due to services and facilities given by them.

3. Advertisement : This measure is very extensively used method of product differentiation. Products are widely advertised through newspapers, magazines, radio and television, sponsorship of various events, street hoarding, and exhibitions and so

on. However advertisements fall in two categories. a) Informative advertisement, which provide information regarding the availability, quality, improvements, utility of the products. b) Persuasive advertisement. To make customers impressive and fruitful, very often the advertisements are framed around personalities like cricketers and film stars and other who can be impressive.

B) Selling Cost :

The cost incurred on advertisement, publicity and statesmanship are known as selling costs. In other words, Selling cost is the cost incurred by a seller under monopolistic competition for creating demand for his product through product differentiation. Selling cost includes expenses on advertisement, salary of salesmen, expenses of sales cell, cost of display of the product, exhibition expenses, discount and commissions offered to special dealers, cost of gift materials, expenses on facilities like free home delivery, etc. As we know, selling costs are an addition to the costs of production. Chamberlin while drawing the distinction between production cost and selling costs writes that these costs which are 'made to adapt the product to the demand are costs of production; those made to adapt the demand to the product are costs of selling'. As a result of sales promotion, the buyers preferences for the product will be stronger and the demand curve will therefore be less steeper and it will shift to the right and away from the point of origin. At the same time, since selling costs are added to the costs of production, the new average cost curves will shift upwards.

Effect of selling cost on AC curve

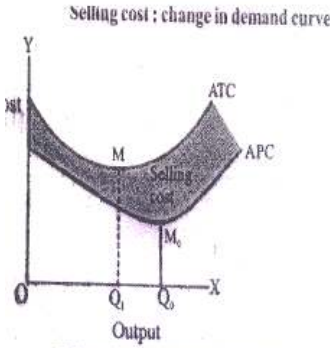


Diagram No 3.9

In above diagram,

APC = AC curve without selling costs (production cost only)

OQ0 = minimum AC output without selling cost

Selling cost gets added to the production cost, so the AC curves shifts upwards (ATC)

ATC = Production cost + Selling cost

ATC = Final AC curve of the firm with selling cost

OQ1 = Minimum AC output with selling cost

OQ1 < OQ0 = Minimum AC output with selling cost is less than without selling cost.

Excess profit with selling cost :

Generally, various measures for demand creation have a short-run orientation. The structure of measures undergoes a change over time as it depends on market situation. Therefore, effect of selling cost on price and output levels of the firm is considered from the point of view of short-run and that too for maximization of short-run excess profit.

Excess profit with selling cost

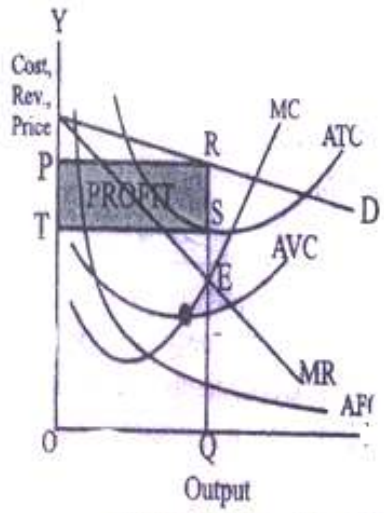


Diagram No. 3.10

In above diagram,

E= Equilibrium

OQ = Output

OP (=RQ) = price

SQ: ATC

So, P > ATC

RS =profit per unit

PRST = total profit (excess profit)

Effects of Selling Cost on Demand Curve :

Selling cost has more use in monopolistic competition, as there are many sellers and many buyers with heterogeneous goods, the level of competition directly varies with the amount of advertising as well as other means of selling cost and promotional measures. The sellers are interested in maximizing this excess profit by increasing their selling cost from time to time. Higher the selling cost more can be the profit. This has resulted in very often the increase in the sale of the product. In short, with more selling cost, demand increases and so output increases and as a final result profit increases. This effect is shown in the following diagram.

Effect of selling cost on demand

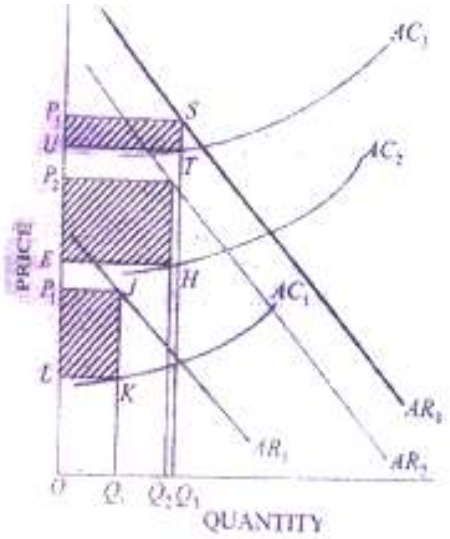


Diagram No. 3.11

In the above diagram a firm with its initial expenditure (for example Rs. 1 lakh) on advertising is able to make profit to tune of P1JKL. AR is the demand curve, the

firm is producing OQ1 quantity and making profit of P1JKL. As the advertisement (selling cost) increased due to this AC1 shifts to AC2 and due to this the demand curve increases more, that is upto AR2 and the said firm producing OQ2 and it is making enormous amount of profit P2GHE. In the third case if you further increase your advertisement or selling cost this increases the cost of AC3 the demand curve shifts to AR3. The firm is selling OQ3 output and making profit to the amount of P3STV. The following table gives the complete picture of the relationship between selling cost, increase in demand curve and the total profit.

Selling Cost	AC	Demand Curve	Price	Output	Excess Profit
Rs. 1 lakh	AC1	AR1	OP1	OQ1	P1JKL
Rs. 2 lakh	AC2	AR2	OP2	OQ2	P2GHE
Rs. 3 lakh	AC3	AR3	OP3	OQ3	P3STV

It would be clear from these details that with selling cost. This brings out the two important conclusions:

1. It is not always true that increase in selling cost brings about increase in profit.
2. There exists a direct relation between increase in selling cost and increase I profit.

Excess Capacity under Monopolistic Competition:

Chamberlin is the pioneer in presentation the concept of monopolistic competition. In the course of discussion of working of this market, he has brought out the possibility of 'excess capacity' as an inevitable outcome. According to Chamberlin, "excess capacity is the different between the output at the firm's tangency point and the output at the industry's tangency point'. According to him firms operate at the point on the falling portion of long-run average cost curve, that is, they do not produce the level of output at which long-run average cost curve is minimum. Long-run equilibrium of a firm under monopolistic competition is achieved when the demand curve facing a firm becomes tangential to the long-run average cost curve so that is earns only normal profits. Under such circumstances a firm can reduce average cost, but it will not do so because its profits are maximized at the level of output smaller than that at which its long-run average cost is minimum.

It is pointed out that product differentiation and free entry of firms together contribute to the emergence of excess capacity under monopolistic competition. Implied in this thinking is the fact that in this market sellers do not attempt to compete with others in the market by cutting prices; that is, normally, there is no price competition. Non-price competition is generally resorted to. Therefore, failure of price competition to function leads to excess capacity. The concept of excess capacity is explained with the following diagram.

Excess Capacity under Monopolistic Competition

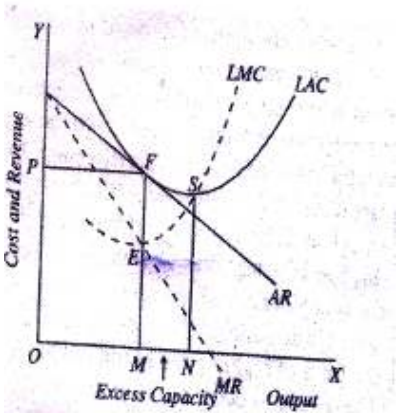


Diagram No 3.12

In above diagram,

OM = output

F = Equilibrium (MC = MR and AC = AR) AR is tangential to AC at point F corresponding to output OM

In the long-run the average cost is continuously decreasing upto the ON output level. Therefore firm can produce or expand its production upto ON level and reduce its long-run average cost to the minimum. Ideal output is the output at which long-run average cost is minimum. Therefore, the firm is producing MN less than the ideal output. Thus MN output represents the excess capacity which emerges under monopolistic competition.

3.2.9 Oligopoly :

We have studied price and output determination under three market forms, namely perfect competition, monopoly and monopolistic competition. However, in

the real world economies we find that many of the industries are oligopolistic. Oligopoly is an important form of imperfect competition. Oligopoly is often described as 'competition among the few'. In other words, when there are few (two to ten) sellers in a market selling homogeneous or differentiated products, oligopoly is said to exist. Consider the example of cold drinks industry, automobile industry, chemical industry, oil refinery, fertilizers, the market is oligopolistic one.

The oligopoly market is classified into following groups.

a) **Pure and differentiated Oligopoly :** If the oligopoly product is homogeneous, it is called as a pure oligopoly. When the product is differentiated, then it is called as differentiated oligopoly.

b) **Collusive and Non-Collusive Oligopoly :** If the oligopolists join together and take care their business decisions collectively, it is called as a collusive oligopoly. In a non-collusive oligopoly the business decisions are taken independently.

c) **Oligopoly with price leadership :** If the firms in an oligopoly market follow the pricing decision of their leader, it becomes oligopoly with price leadership. The leader firm may be a dominant firm or old firm or firm with lowest cost.

Characteristic features of Oligopoly :

Oligopoly market has following important features.

1. Interdependence : The most important feature of oligopoly is interdependence indecision-making of the few firms which comprise the industry. This is because when the number of competitors is few, any change in price, output, product, by a firm will have direct effect on the fortune of the rivals, who will then retaliate in changing their own prices, output or advertising technique as the case may be. It is therefore, clear that an oligopolistic firm must consider not only the market demand or the industry product but also the reactions of other firms in the industry to any major decision it takes.

2. Importance of selling cost : Under oligopoly the advertisement can become a life and death matter. In order to maintain the market share every firm uses advertisement as an effective weapon. For this various firms have to incure a good deal of costs on advertising and other measures of sales promotion.

3. Group behaviour : Under oligopoly the firm's behaviour cannot be explained merely by profit maximization behaviour. It requires the study of group behaviour. The firms may form a collusion or may fight a price war. Do the members of group agree to pull together in promotion of common interest or will they fight to promote their individual interests? Does the group possess any leader? If so, how does he get the other to follow him? These are some of the questions that need to be answered by the business behaviour.

4. Number of Sellers : There exist few sellers in this market. Such cases do exist in large numbers in all the countries. In India, think of the petroleum, cooking gas, telephone, cellular phone, iron and steel, automobile, tyres, refrigerator, cement etc, industries in which we come across limited number of sellers.

5. Number of Buyers : The number of buyers is very large, so large that no single buyer, by his individual or collective action with other buyers, can influence market price by changing demand. This is because the demand of a single buyer is a very small part of the total demand in the market. Consequently, he has to accept the market price as given and adjust his demand to it. The buyer is a 'price- taker' in this market.

6. Nature of the Product: In this context, there are two possibilities.

a) Homogeneous product : All the sellers may be selling perfectly identical products and, therefore, price assumes importance. Product like petrol, diesel, kerosene, cooking gas, iron and steel, aluminium, cement fall into this category. Market of this kind is described as 'pure oligopoly'.

b) Differentiated product : Oligopolists have the choice of following product differentiation. Cellular telephones, tyres, refrigerators, detergent soaps, soft drinks automobile etc. fall into this category. Every seller enjoys a limited monopoly power in the market. Market of this kind is described as 'differentiated oligopoly'.

7. Barriers to Entry :

In oligopolistic industry, obstacles to entry are formidable. Entry of new firms is prevented by ownership of crucial patents or ownership of vital raw materials. Many times technological conditions are such that production is economic only on a large scale. A new firm therefore will have to start production on a large scale from the very outset. It is not possible to make a modest beginning and expanding gradually as

the firm gets established. As such, the scale of production also may make entry of a new firm difficult. Also, the existing firms enjoy advantages such as reputation of their brand names, long established distribution channels, good-will of the customers etc., and any new firm desirous of entering the field will have to consider these factors which make entry difficult.

8. Demand curve :

It is not easy to trace the demand curve for the product of an oligopolist. Since under oligopoly the exact behaviour pattern of a producer cannot be ascertained , his demand curve cannot be drawn accurately, and with definiteness. How does an individual seller's demand curve look like in oligopoly is most uncertain because a seller's price or output moves leads to unpredictable reactions on price-output policies of his rivals, which may have further repercussions on his price and output.

Price Determination under Oligopoly:

With these characteristics of oligopoly, we study the determination of prices and outputs by oligopolistic firm. We shall confine our study to the non-collusive oligopoly (kinked demand curve) and to the collusive oligopoly models.

I) Kinked Demand Curve (Rigid prices): Non-collusive Oligopoly :

Paul Sweezy first presented in 1939 his analysis of non-collusive oligopoly by means of a 'kinked demand curve'. This analysis is based in the assumptions that the rivals in the market ignore their mutual dependence and attempt to decide their policies on their own Rivals' possible reactions are not thought of in advance. No seller joins hands with anybody in the market and hence this case is described as non-collusive oligopoly.

It is for explaining price and output under oligopoly with product differentiation, that economists often use the kinked demand curve hypothesis. This is because when under oligopoly products are differentiated, it is unlikely that when a firm raises its price, all customers would leave it because some customers are intimately attached to it due to product differentiation. As a result, demand curve facing a firm under differentiated oligopoly is not perfectly elastic. On the other hand, if the oligopolistic firm increases their price, its rival will not follow it and change their prices. Thus the quantity demanded of this firm will fall considerably. This portion of the demand curve is relatively elastic. In these two situations, the demand curve of the

oligopolistic form has a kink at the prevailing market price which explains price rigidity.

The kink is formed at the prevailing price level because the segment of the demand curve above the prevailing price level is highly elastic and segment of the demand curve below the prevailing price is inelastic.

Kinked Demand Curve under Oligopoly

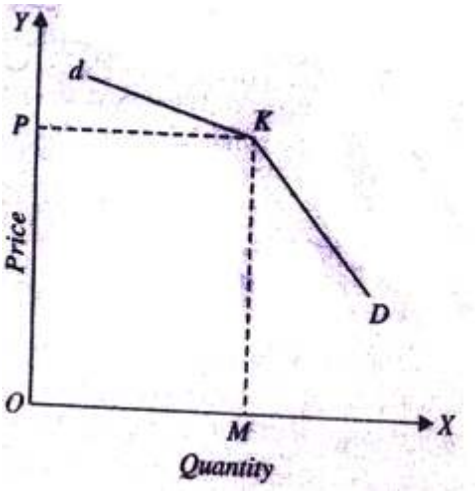


Diagram No 3.13

A kinked demand curve dD with a kink at point K has been shown in the diagram. The prevailing price level is OP and the firm is producing and selling the output OM. Now, the upper segment dK of the demand curve dD is relatively elastic and the lower segment KD is relatively inelastic. This difference in elasticities is due to particular competitive reaction pattern assumed by the kinked demand curve hypotheses.

The price-output relationship in the oligopolistic market is explained in the following diagram.

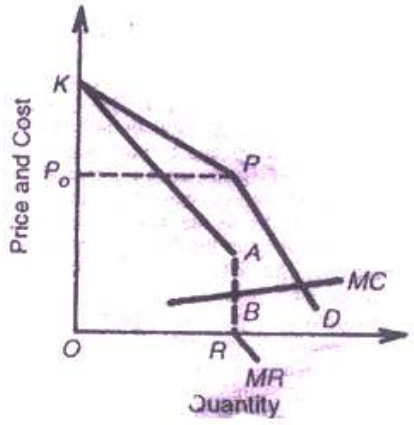


Diagram No. 3.14

In above diagram,

KPD = kinked demand curve

OP0 = the prevailing price

OR = Quantity produced by one seller.

Starting from point P, corresponding to the current price OP0, any increase in price above it will considerably reduce his sales, for his rivals are not expected to follow his price increase. This is because the KP portion of the kinked demand curve is elastic, and the corresponding portion KA of the MR curve is positive. Therefore, any price increase will not only reduce his total sale but also his total revenue and profit.

On the other hand, if the seller reduces the price of the product below OP0 (or P) his rivals will also reduce their prices, Though he will increase his sales, his profit would be less than before. The reason is that the PD portion of the kinked demand curve below P is less elastic and the corresponding part of marginal revenue curve below R is negative. Thus in both the price-raising and price-reducing situation the seller will be a loser. He would stick to the prevailing market price OP0 which remains rigid.

In oligopoly under the kinked demand curve, let us analyze the effect of changes in cost certain range do not affect the prevailing price.

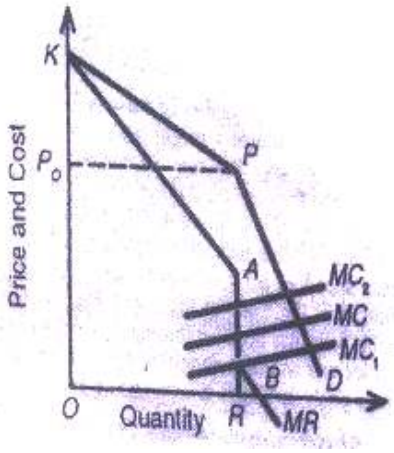


Diagram No. 3.15

Suppose the cost of production falls so that the new MC curve is MC1 to the right, as in the diagram above, it cuts the MR curve in the gap AB so that the profit maximizing output is OR which can be sold at OP0 price. It should be noted that with any cost reduction the new MC curve will always cut the MT curve in the gap because as costs fall the gap AB continues to widen due to two reasons:

a) As costs fall, the upper portion KP of the demand curve becomes more elastic because of the greater certainty that a price rise by one seller will not be followed by the rivals and his sales would be considerably reduced.

b) With the reduction in costs the lower portion PD of the kinked demand curve becomes more elastic, because of the greater certainty that a price reduction by one seller will be followed by the other rivals. Thus the angle KPD tends to be a right angle at P and the gap AB widens so that any MC curve below point A will cut the marginal revenue curve inside the gap. The net result is the same output OR at the same price OP0 and larger profits for the oligopolistic sellers.

In case the cost of production rises the marginal cost curve will shift to the left of the old curve MC as MC2. So long as the higher MC curve intersects the MR curve within the gap upto point A, the price situation will be rigid. However, with the rise in costs the price is not likely to remain stable indefinitely and if the MC curve rises above point A, it will intersect the MC curve in the portion KA so that a lesser quantity is sold at a higher price. We may conclude that there may be price stability under oligopoly even when costs change so long as the MC curve cuts in its

discontinuous portion. However, chances of the existence of price-rigidity are greater where there is a reduction in costs that there is a rise in costs.

II) Collusive Oligopoly :

Collusive oligopoly is a situation in which firms in a particular industry decide to join together as a single unit for the purpose of maximizing their joint profits and to negotiate among themselves so as to share the market. The former is known as the joint profit maximization cartel and the latter as the market-sharing cartel. There is another type of collusion, known as leadership, which is based on tactit agreements. Under it, one firm acts as the price leader and fixes the price for the product while other firms follow it. Price leadership is of three types: low cost firm, dominant firm and barometric.

A) Cartels : (Complete collusion):

A cartel is an association of independent firms within the same industry. The cartel follows common policies relating to prices, outputs, sales and profit maximization and distribution of products. Cartels may be voluntary or compulsory and open or secret depending upon the policy of the government with regard to their formation. Thus cartels have many forms and use many devices in order to follow varied common policies depending upon the type of cartel. Cartel is formed for the purpose of market sharing or joint profit maximization of all the firms.

Price-output under cartel :

Condition of equilibrium:

1. For the cartel, MR = MC
2. For the each firm, MR should be equal to MC of each firm, that is, MR =MC1 =MC2---------=MCn

Steps involved in the analysis:

1. We assume that two firms have formed a cartel
2. Two firms produce a homogeneous product
3. We first find out the industry output fixed by the cartel by intersection of MR and MC curves.
4. That also will fix the price of the product

5. Each firm has different cost situation. Hence, industry MC curve is a sum-total of MC curves of the two firms.

6. We transfer the levels of MR and price at equilibrium to the diagrams of the two firms by a horizontal dotted line to find their equilibrium situation.

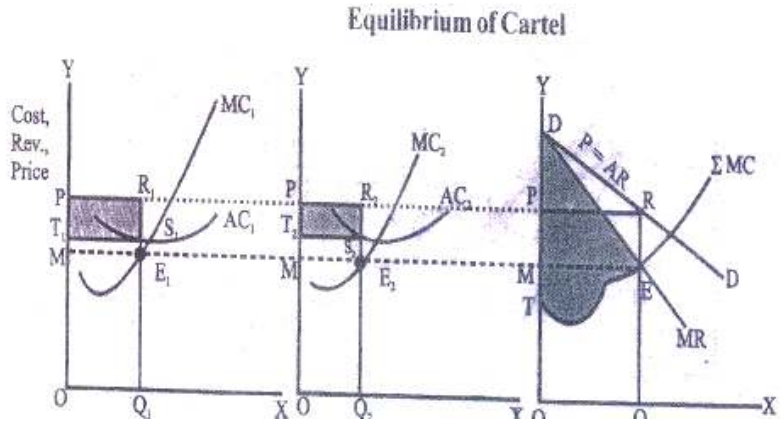


Diagram No. 3.16

In the above diagram, given the market demand curve and its corresponding MR curve, joint profits will be maximized when the industry MR equals the industry MC, this situation where D is the market (or cartel) demand curve and MR is its corresponding marginal revenue curve. The aggregate marginal cost curve of the industry ?MC is drawn by the lateral summation of the MC curves of firms A and B, so that ?MC = MC1 + MC2. The cartel solution that maxixises joint profit is determined at point E where the ?MC curve intersects the industry MR curve. Consequently, total output is OQ which will be sold at OP = (QR) price. As under monololy, the cartel board will allocate the industry output by equating the industry MR to the marginal cost of each firm. The share of each firm in the industry output is obtained by drawing a straight dotted line from E to the vertical axis which passes through the curves MC2 and MC1 of firms B and A at point E2 and E1 respectively. Thus the share of firm A is OQ1 and that of firm B is OQ2 which equals the total output OQ (OQ1 +OQ2). The price OP and the output OQ distributed between A and B firms in the ratio of OQ1 : OQ2 is the monopoly solution. Firm A with the lower costs sells a larger output OQ1 than firm B with higher costs so that OQ1>OQ2. But this does not mean that A will be getting more profit than B. The joint maximum profit is the sum of PR1S1T1 and PR2S2T2 earned by A and B respectively. DET is

the maximum profit. DET = PR1S1T1 + PR2S2T2. It will be pooled into a fund and distributed by the cartel board accordingly to the agreement arrived at by the two firms at the time of the formation of the cartel. A pooling agreement of this type will make it possible for both firms to maximize their joint profit provided the total profits earned by them independently do not exceed the former.

B) Price Leadership: (Partial collusion):

Price leadership is the imperfect collusion among the oligopolistic firms in an industry when all firms follow the lead of one big firm. In oligopolistic market, among various firms operating, one firm can be identified as market leader firm on either of the following basis:

a) An efficient and so low cost firm

b) A dominant firm with largest market share

c) An experienced firm working as a barometer

A) Leader firm: the firm giving leadership

B) Follower firms: all the other firms in the market

The Low Cost Price Leadership Model : In the low-cost price leadership model, an oligopolistic firm having lower costs than the other firms sets a lower price which the other firms have to follow. Thus the low-cost firm becomes the price leader. The process is explained with the help of following diagram. We assume that there are two firms, one leader and one follower, of a homogeneous product and both share the market equally. Their cost curves are different.

Price leadership of a low cost firm - Oligopoly

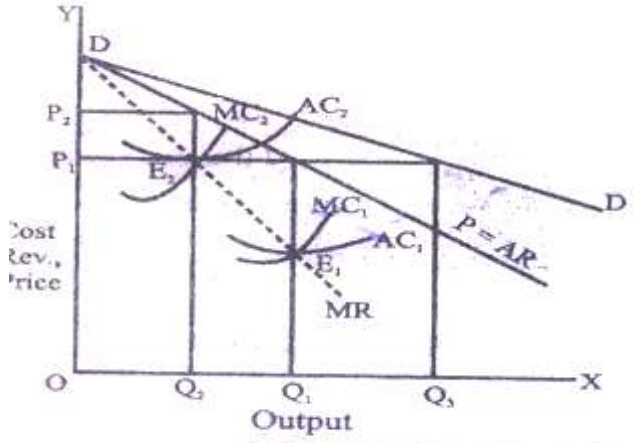


Diagram No. 3.17

In the above diagram,

DD = market demand curve

Dd = demand curve faced by individual sellers

MR = marginal revenue curve corresponding to demand curve Dd.

Leader firm	**Follower firm**
AC1 and MC1 : cost curves	AC2 and MC2 : cost curves
E1 : Equilibrium (MR = MC)	E2 : equilibrium (MR=MC)
OQ1 : Output	OQ2 : expected output
OP1 : price set in the market	OP2 : expected price
Profit maximization price and output	There are profit maximization price and output of the firm But they cannot be finalized; firm should accept OP1 price fixed by the leader firm and produce OQ1 output as leader firm Hence, no profit maximization.

An important point, the follower firm should accept both the price and output level set by the leader firm if price leadership arrangement is to function smoothly. On the contrary, if the follower firm accepts only the price and does not accept the output directive, then the price leadership arrangement would fail. Because, if the follower firm produces less than the obligatory output OQ1, say OQ2, then the market supply would be OQ1 + OQ2 which would be less than OQ3 (OQ1 + OQ2). Shortage of supply in the market will then push up the price beyond OP1. The follower firm will benefit with more revenue, but the leader firm will get less than maximum profit and hence will be a loser.

3.2.10 Pricing Practices : Cost plus, Multiple and Transfer

Introduction

Now a days, the subject of pricing in economic theory is an very important issue. It has both theoretical and applied aspects. Traditional theory of pricing emphasizes on the marginal principal of pricing, i.e. where marginal cost equals marginal revenue (MC = MR), the price and output of a firm, in every kind of market is determined. This is called marginal principle or marganility rule. But in actual

practices, it is found that marginal principle of pricing does not operate. Evidences shown that firms, while fixing the prices of their products do not follows the marginality rule. They determine prices according to their business motives and prevailing market conditions.

Firms are operating in market not only with the objective of profit maximization but also with the objectives of sales maximization, revenue maximization, retaining in market, etc.

The firms are aware about their demand and cost conditions. Their price and output decisions are based on probabilities. Hence the marginal principle of equalising MC and MR is found to be absent, in price-output decisions. Empirical studies shown that marginal rule of pricing doesn't found true in actual practice. 'Hall and Hitch' in their empirical study shown that marginal rule fails to be applicable in pricing process of 38 firms. While fixing the prices, firms may consider average cost principle instead of marginal principle.

'Gordon' is also, of same opinion that in real business life, firms are not aware of their MC and MR, and hence the average cost principle of princing is widely used by them. Many other empirical studies support this view. Thus, there is a little link between pricing theory and pricing practices. Therefore it is necessary to understand the various forms of pricing techniques followed by the firms in actual practices. They are as follows.

3.2.910.1 Cost-Plus Pricing

According to 'Hall and Hitch' and 'Andrew' in actual practices, firms are not determining the prices of their products according to the 'marginality principle' i.e. MC = MR, but they are using the 'average cost principle'. So, it is called 'full-cost theory' or 'cost-plus pricing'. Also it is called 'mark-up princing.' In actual practice firms are fixing prices according to the average cost of production. This is the most common method of pricing of a product used by various firms.

The 'Hall and Hitch' eminent Economists in Oxford University studied the pricing techniques of 38 firms through actual working. They found that firms didn't considered the marginality rule i.e. MC = MR, while determining the prices of their products. They had not considered the maximum profit but they considered the satisfactory level of profit. So the firms can consider the full cost while fixing the prices instead of marginal cost. Full cost means the average variable cost + average

fixed cost + a certain proportion of profit i.e. mark up on price. The full cost is computed as

Full cost = AVC + AFC + M

Thus, price is set as

Price = full cost.

Hence,

P = AVC + AFC + M

Where, P = Price

AVC = Average variable cost

AFC = Average fixed cost

M = Mark-up percentage

The mark-up percentage is fixed. Thus, price is equal to the average fixed cost + average variable cost + mark-up percentage. In this method while fixing the price of a product, firms are taking into consideration. Total average cost + certain proportion of profit, i.e. mark up on price. Therefore this method is called "cost-plus pricing."

We can illustrate this method with the help of following example.

e.g. Suppose x firm can produces output of 1000 units per day. It recurs Total fixed cost of Rs. 4000 and Total variable cost of Rs. 6000, also it determines 10% of profit margin (i.e. mark-up) on it. What will be the price charged by the firm according cost-plus pricing ?

First, we can calculate the per unit average fixed cost by using following formula.

AFC = TFC/TP

= 4000/1000

= Rs. 4 per unit.

Where, AFc = Average fixed cost

TFc = Total fixed cost

TP = Total production

Similarly calculate the per unit average variable cost.

AVC = TVC/TP

= 6000/1000

= Rs. 6 per unit.

Where, AVC = Average variable cost

TVC = Total variable cost

TP = Total production.

Total average cost per unit will be equal to average fixed cost + average variable cost.

Total average cost per unit = AFC + AVC

= 4 + 6 = Rs.10

Net profit margin (i.e. mark-up) to total average cost per unit will be assumed 10%. It is computed as.

Net profit margin = Total average cost per unit x Mark-up

= 10 x 10 / 100

Net profit margin = Rs. 1

Price = Total average cost per unit x Net profit margin

Rs.11 = 10 + 1

Thus Rs. 11 price will be determined by the firm.

3.2.10.2 Multiple Pricing

The traditional pricing theory is based on the assumption that a firm can produce a single homogeneous product. In actual life firms are producing different types of multiple products. They are differ in size, shape, colour, odour, tastes etc. All firms have more than one product. Also most specilized firm can produce a product in multiple models, various size, shapes, tastes; odours, e.g. Hindustan lever company produces different kinds of bathing soaps, named, Liril, Lux, Moti, Lifebuoys, Rexona etc. They differ in all respects but they are in its line of production. These products are differentiated according to the consumer's view, but close and perfect substitutes to each other. Each product has different average revenue (AR) and Marginal revenue (MR) curves. Each product is competiting with others of a single

firm. This results into production interdepsndency, in the form of joint products or alternative products. Pricing of this products is called multiproduct pricing or product line princing.

The pricing of such multiple products needs special consideration than pricing of single product. Because, each product has a separate demand curve but they all are produced by a single firm which have inseperable marginal cost curve. In this case AR and MR curves are separate but AC and MC curves are not separate. So marginality rule straight way can't be applicable to the price of each product separately. Hence, the problem raises that how to fix the price of such multiple products.

This problem of fixation of price of multiple product is solved by 'E. W. Clemens' by the price determination in discriminating monopoly. Multi-product firm tries to maximize its revenue in all its markets. Price determination by the multi-product firm can be explained with the help of following diagram.

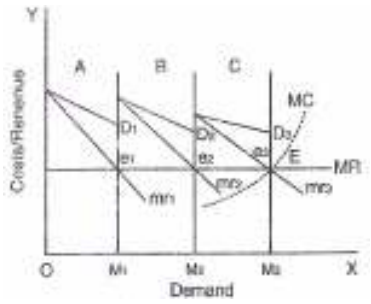


Fig. 3.18

Suppose that a firm producing three types of products, i.e. A, B, and C. The AR and MR

curves of these three products are shown as (AR = D): D1, D2, D3, we get MR,

Total marginal revenue	=	Marginal revenue of A product	+	Marginal revenue of B product	+	Marginal revenue of C product
MR	=	D_1	+	D_2	+	D_3

In the figure MC curves intersects EMR curve from below at the point E, Hence, the equilibrium of the firm is established at point E. Therefore firm produces OM_3 of

total output. If we drawn a horizontal line from equilibrium point E towards Y-axis, it meets to MR_3 curve at point e_3, Mr_2 curve at point e_2, and Mr_1 curve at point e_1. So in OM_3 total production share of product A is OM_1, share of product B is M_1M_2 and share of product C is M_2M_3. Their prices are charged M_1e_1, M_2e_2 and M_3e_3 respectively. By determining these prices of various goods, multiple product firm can maximize it's profit.

3.2.10.3 Transfer Pricing

Transfer pricing is related with the pricing techniques of very large firms. It is recent addition to the pricing theory. Large firms divide their production process into various divisions, subsidiaries and departments. The goods produced by one division or firm is used as inputs by the other divisions or firms. Therefore, the large firms are facing the problem of appropriate price determination of the goods transferred amount the various divisions or the departments of that large firm. This is called the princing of intrafirm transfer product. Each division or department has separate profit function.

'Hirshleifer' has provided a systematic treatment of the transfer pricing techniques to solve the problem of determination of transfer pricing. In practice actual solution for transfer princing is dependent upon the following conditions.

1) Prevailing market price of the product,
2) Power of divisional manager to bargain for intra-divisional transfer prices.
3) The full costs principle.

1) Use of market price :

Suppose, that product transferred from one to another divisions has a already prevailing market price. The transfer price is determined equal to the prevailing market price, i.e. prevailing market price should be the transfer price, e.g. Suppose there are two divisions A and B, B division is using the product of A as input and A sells it's product to B at higher price than market price. It incurs losses to the B division. On the contrary, if A sells its product at the lower price than existing market price. It causes losses to the A division. Therefore firm can determine the price of intra-divisional transfer product equal to the existing market price. However the quality of intra-divisional transfer firm should be equal to the quality and standard of market product.

2) Bargaining power of divisional Manager :

This method of transfer price determination is suggested by 'Joel Dean'. He says that if a divisional manager has given absolute power to determination of the transfer price. He can determine the transfer price by negotiations. He makes negotiations alike market negotiations and transfer price is determined. When there is absence of market price for intra-divisional transfer product. This is the best method of transfer price determination.

3) Transfer price based on cost :

When the product of a firm is sold only among the internal divisions (i.e. Intra-divisional Transfer) of the firm and there is no outside market is available to the product of a firm. The transfer price is determined according to the marginal cost principle. Where the firm gets maximum profit. All the divisions of a firm also get the maximum profit. This type of transfer price determination will be explained with the help of following figure.

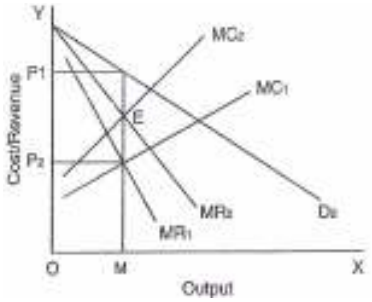


Fig. 3.20

Suppose a firm has two divisions A and B. A is manufacturing division, which sells it's product to division B, which is distributing division. There is no external market in existence to the firms product produced in division A. Division A will sell it's product to division B i.e. infra-firm transfer at the price equals to the equilibrium price determined at MC = MR. Where MC equals the MR of the division A.

D_2 is the demand curve, MR_1 and MC_1 are the marginal revenue and marginal cost curves of the division A. which is producing intermediate product. MC_2 and MR_2, are the marginal cost curve and marginal revenue curve of the division B. MC_2 curve intersects MR_2, curve from below at point E. Therefore Division B will sell

OM output which is profitable to division B. At the same output below the point E_1 MC_1 intersects MR_1 from below equilibrium of division A, also established at output OM. Output OM will be optimal output for division A. Hence the division A will sell OM output and charges OP_2, price. Thus Intra-firm price i.e. transfer price will be the OP_2. It will be determined according to the cost of production incurred to the firm A.

3.3 Summary

Production, consumption and costs are the important concepts used in managerial economics for the determination of pricing policy. The term production function denotes the functional relationship between the inputs used for the production process and the output of a firm. The formula of production function is :

$$X = f(LKRSVX)$$

The production function is a flow concept. Time element is an important part of this concept. There are two types of production function in Economics i.e. short-run production function and long-run production function. The law of variable proportion is applicable for short-run production function. Increasing returns, decreasing returns and negative returns are the 3 stages of short-run production function. The long-run production function, we apply the laws of returns to scale which as also 3 stages i.e. increasing, constant and decreasing returns. These two types of production function theories clears the input and output relations in short and long-run period.

Cobb-Douglas production function implies the functional relationship between two inputs (labour and capital) and output. It is based on the emperial study of manufacturing sector in American economy. The emperical evidence of cost curves represents the L shaped longrun cost curve in stead of U shaped longrun cost curves.

The last concept of this particular unit, is of break even analysis. Break even analysis is a technique which indicates the relationship between production cost and revenue of a firm with its volume. Now-a-days every manager of a business firm has to use this concepts for getting optimum output and profit margin. The formula of break even point or analysis is as under.

$$BEP = \frac{TFC}{P - AVC}$$

Break even analysis gives us the guidelines for production and pricing policy.

The market is a set of conditions in which buyers and sellers come in contact for the purpose of exchange. The market situations vary in their structure. Different market structures affect the behaviour of buyers and sellers. Further, different prices and trade volumes are influenced by different market structures. Again, all kinds of markets are not equally efficient in the exploitation of resources and consumers welfare also varies accordingly. Hence, the different aspects of the pricing process be analyzed in relation to the different types of markets.

Traditionally, the nature of competition is adopted as the fundamental criterion for distinguishing different types of market structure. The degree of competition may vary among the sellers as well as the buyers in different market solution. Usually, the market structures are classified in accordance with the nature of competition among the sellers. The nature of competition among the sellers is viewed on the basis of two major aspects, 1) The number of firms in the market and 2) The characteristics o products, such as whether the products are homogeneous or differentiated.

Monopolistic competition refers to the market structure in which there are a large number of firms producing similar but non- identical products. Monopolistic competition is a blend of monopoly and perfect competition. Monopolistic competition is similar to perfect competition in that it has a large number of sellers, but its dissimilarities lie in its product differentiation. In perfect competition, goods are identical or homogeneous, while in monopolistic competition, products are differentiated through trade mark, brand names, etc. Product differentiation confers a degree of monopoly to each seller in a market under monopolistic competition. Thus, in such a market, many monopolists compete with each other than on the selling side. There are a large number of buyers too. But each buyer has preference for a particular seller or brand of the product in the market.

Oligopoly refers to the market structure where there are a few sellers in a given line of production. Fellner defines oligopoly as "competition among the few". In an oligopolistic market, firms may be producing either a homogeneous product or may have product differentiation in a given line of production. The oligopoly model fits well in such industries as automobile, manufacturing of electrical appliances, etc.

Pricing of a product is an important issue today. Existence of industries depends upon the prices got to their products. There are various methods of pricing adopted by private enterprizes. They are as follows.

1) cost plus pricing, 2) multiple pricing, 3) price discrimination, 4) transfer pricing etc.

By applying these methods enterprizes are earning profit.

3.4 Glossary

- **Production Function -** The functional relationship between physical input and physical output is production function.
- **Linear homogeneous production function -** The increase in input leads to proportionate increase in output.
- **Censtant returns to scale -** Increase in output in same proportion with increase in input is called constant returns to scale.
- **Break Even Analysis :** Break even analysis is a technique which indicates the relationship between production cost and revenue of a firm with its volume.
- **Cost of Production** : Cost of production is the aggregate if sacrifice done directly or indirectly for the production of an unit or an aggregate of units of a commodity.
- **Marginal Cost** : Marginal cost is addition to total cost due to the additional unit produced.
- **Plant** : A plant is a technical unit of production.
- **Industry** : An industry is a group of firms in a region engaged in the same or similar production activity.
- **Market** : The term market represents mechanism of exchange of a product which may be homogeneous or differentiated.
- **Market Structure** : Market structure represents the existence of degree of competitiveness among firms operating in the market.

3.5 Objectives Questions.

A) Rewrite the following sentences by choosing correct alternatives.

1. Production function is the relationship between ..... and output within the given technology.

   (a) input (b) income (c) interest (d) raw-material

2. Laws of variable proportion denotes ..... production function.

(a) short-run (b) fixed (c) long-run (d) leaner

3. Long-run production function has ..... stages.

(a) 2 (b) 3 (c) 4 (d) 6

4. Break even analysis is important for increasing ..... margin of a business.

(a) interest (b) profit

(c) employment (d) production cost

5. In what situation monopolist can get excess profit?

a) P< ATC b) P > ATC

c) P = ATC d) None of the above

6. What is the nature of commodity under the monopolistic competition?

a) homogeneous b) differentiate

c) close substitutes d) both b and c

7. If a price making monopolist firm wants to maximize its sales revenue, it should----------

a) set the highest price it can get

b) set the lowest price it can get

c) choose a selling price at which the elasticity of demand for its product is unity

d) choose a selling price where the extra revenue received from the last unit sold exceeds the extra cost of making that unit.

B) Answer in one sentence only.

1. How many stages are there in a short-run production function ?
2. What is the shape of short-run average cost ?
3. State the formula of break even analysis.
4. In which country Cobb-Douglas have made emperical study.

5. With reference to which sector Cobb-Douglas have carried out their emperial study.
6. What is the slope of Long Run Average Cost Curve is stated by traditional economic theory?
7. Due to which reasons Long Run Average Cost Curve is L - shaped?

3.6 Self Assessment Questions

A) Write short notes on -

a) Production Function

b) Break Even Analysis

c) L shaped long run Average cost curve

d) Characteristics of Monopolistic Competition

e) Characteristics of Oligopoly

f) Mark up rule

g) Transfer pricing

B) Essay type or Broad Questions.

1. What do you mean by production function ? Explain short-run production function in detail.
2. Explain briefly Cobb-Douglas production function.
3. State the relationship between short run and long-run cost curves.
4. Critically examine the concept of 'Break Even Analysis'.
5. Explain Govdwin theory of trade cycle.
6. What is the learning curve? What are the factors that bring about learning curve effect?
7. What is monopolistic competition? Explain the important features of monopolistic competition.
8. What is product differentiation? What role does it play in the determination of price and output under monopolistic competition?

9. What is Oligopoly? State the price determination process under this market.
10. Fully explain cost plus pricing.
11. What is multiple pricing ? How multiple pricing takes place.
12. State the transfer price determination in the market.
13. Explain the price discrimination.
14. Discuss the Dumping.

3.7 Books for Further Readings.

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❑❑❑

Unit-4

Theory of Business Cycles and Inflation

Index :

4.0 Objectives

1. To study Business Cycles.
2. To study the causes of emergence of business cycles i.e. Theories of Business Cycles.
3. To study the theories of inflections
4. To study the Relation between Unemployment and Inflation.

4.1 Introduction

Trade cycles are also known as business cycles. They are economic fluctuations, i.e. ups and downs or booms and slumps in business activities. They influence the business decisions. Business cycle causes the inflation and deflation and also leads to higher employment and unemployment in economy. Thus, business cycles affect the whole economy regarding the economic growth and development positively as well as negatively. When business cycle results into prosperity and booms, it leads to higher economic development. On the other hand, when it causes slumps and economic depression, it leads to unemployment and retards the economic development. Thus, the problem of business cycle is a macro-economic problem. In order to achieve the sustained economic development, business cycles should be controlled by applying a suitable economic policy.

The business cycle is defined by the most eminent scholars as follow.

According to 'Prof. Haberler', "The business cycle in general sense may be defined as an alternation of periods of prosperity and depression of good and bad trade." 'Mitehell' defined it as, "Business cycles are species of fluctuations in the economic activities of organized communities."

'Hawtery' calls it as "Trade cycle is a monetary phenomenon."

According to 'Keynes', "A business cycle as composed of periods of good trade characterized by rising prices and low unemployment periods of bad trade characterized by falling prices and high unemployment percentages."

'Gordon' defined as "business cycles consists of recurring alternations of expansion and contraction in aggregate economic activity, the alternating movements in each direction being self-reinforcing and prevailing virtually all parts of the economy."

4.2 Features of Business-cycles

Various definitions of business cycles show the following features.

1) Business cycles are of short period as well as long period.
2) They are synchronic, i.e. when they start in one sector, they spread to other sectors also.
3) Business cycle is a phenomenon, which affects the whole economy.
4) It has four phases, viz, prosperity, recession, depression and recovery.

5) Business cycles are recurrent and recurring, i.e. They appears again and. again, prosperity is followed by depression.

6) Business cycles are regularly appearing cycles in capitalistic economy.

7) They begin from any stage, i.e. prosperity, depression, recovery or recession.

8) Business cycle is cumulative and self reinforcing phenomenon. It's one phase gives rise to another phase.

9) They are asymmetrical i.e. prosperity stage is slowly and gradually appearing stage, while the depression is rapidly appearing stage.

10) Business cycles have different impact on different industries.

11) They are international in character. They are passed from one country to another through international trade.

4.3 Phases of business - cycle

There are four phases of business cycle. When all of these four phases are to be completed, it is called as the completion, of one business cycle. These four phases are as follows.

1) Recovery

2) Prosperity or boom

3) Recession

4) Depression

Following figure explains the four phases of business cycle.

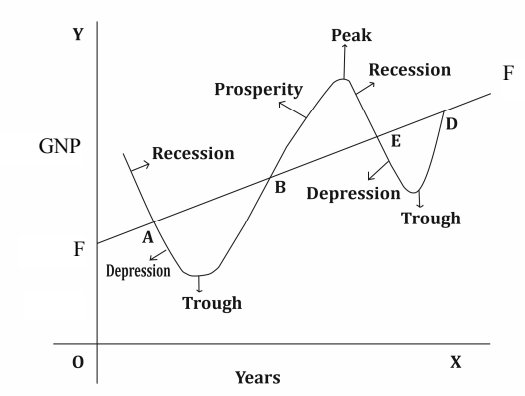


Fig. 4.1

On OY – axis : GNP measured
OX – axis : years measured
FF = Full employment curve

1) Recovery :

When the business cycle begins with recovery, it may be called as the first stage of business cycle. This is the stage, in which the economy turns from depression to prosperity. In this stage all economic factors reveal recovery, total output, employment and income are slowly rising. Increase in economy. Rise in employment leads to increase the income of people, it leads to rise in personal income in turn it leads to increase in demand for various. goods and services. It causes to rise in price, profit, investments, employment and output in economy. Thus, recovery in all economic variables leads to the prosperity stage.

2) Prosperity :

When the recovery in various economic factors reaches to the peak point level, it causes the prosperity stage. As total output, employment and income go on increase price also increases. Higher price leads to higher profit, higher investment, higher employment and output in economy. The rising trend in all these economic factors reaches to apex point. This apex point is referred as boom or prosperity stage. The growth rate of economy reaches at its maximum point in prosperity stage. Optimism prevails in all fields. It gives rise to prosperity.

3) Recession :

Prosperity stage gives rise to disequilibrium between demand and supply. It is found that when supply of goods and services is larger. It leads to price fall. Hence prices of various goods and services go on decrease. It causes to lower profit lower investment, lower employment, lower income. Hence optimism is substituted by pessimism. It causes reduction in bank loans and advances in turn it leads to fall in investment, fall in income, fall in demand, prices, profit and again fail in Investment. Hence the recession appears in economy. It stops the business expansion and leads to reduction in all economic growth variables and adversely affects the reduction in growth rate of economy. Thus finally it results .into economic depression.

4) Depression :

Recessionary stage ultimately gives rise to economic depression. In this stage, business men are aware about their mistakes of excess investment in economy. So

they reduce investment, employment and output. The reduction in investment leads to fall in employment. Fall in employment results into decrease income, demand, prices, profit and again reduction in investment. When the recessionary cycle begins, it becomes intensive. The rate of fall in various economic variables gears up. Recessiory stage becomes intensified and finally it leads to economic depression.

When the economic depression appears the investment, employment, output and income level reaches to it's minimum bottom level. Huge unemployment is the result of economic depression. It stops the production. Thus, economic depression leads to huge unemployment and minimum bottom level of production. The rate of economic growth is very low. The stage of economic depression is very dangerous to economy.

4.4 Theories-of Business-Cycle

In order to explain the phenomenon of business cycle, various theories are given by the various economists. These theories are classified into monetary and non monetary theories. Some economists stressed on economic factors and some on non economic factors. Which are responsible for the emergence of trade cycles.

4.4.1 Cob-web Theory of Business Cycle

Cob-web theory gives a systematic explanation of self-prepetuating cycle of price and quantities of production. This theory is given by 'Henry Schultz' 'Jan Tinbergen' and 'Arthur Hanau'. They developed the price quantity relationship independently. 'Henry Schultz' has .given the name to this price quantity relationship as 'Cob-Wed'Theorem.'

While formulating this theory the economic system is analysed at a point of time and its movements are observed through time. No time lag is assumed. The adjustment between price of a commodity and quantity of commodity-demanded and supplied occurs at the same time. Cob-web theory shows the dynamic explanation of the fluctuations in commodity prices and quantities of production.

This theory is particularly applied to the cycles in prices and quantities of agricultural commodities. It is based on the following assumptions.

Assumptions :

1) Pure competition is existing in market.
2) The price of commodity is dependent upon the supply of commodity available in current period.

3) The production in next time period is governed by the current prices of commodity.

4) Production can't be changed before the expiry of one full period.

This theory explains the three types of fluctions as i) perpetual or Continuous Oscillations or Cobweb ii) Convergent Oscillations or Cobweb iii) Divergent Oscillations or Cobweb.

1) Perpetual oscillations or Cob-Web :

Also, these Oscillations are called Continuous Oscillations or Cobweb. In this type of oscillations the price and production may continue as the price is completely determined by the current supply and supply is wholly determined by the preceding price. The same prices and quantities of production are repeated indefinitely without an equilibrium is being reached. When the demand curve existing is exactly reverase of the supply curve and both curve have the same elasticities, in this situation continuous cobweb or perpetual oscillations are borned in economy. This situation is shown in the following figure.

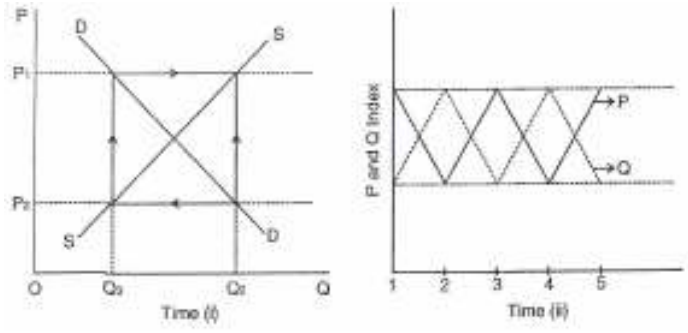


Fig. 4.2

Figure (i) reveals the continuous Cob-Web or Perpetual Oscillations. DD is demand. curve and SS is supply curve. P_1 is the initial price in the first time period to the corresponding supply Q_3. In (he second time period the production increases to Q_2 due to the higher price P_1 existing in the first period. At Q_2 production, supply remains greater than demand (S>D). So price falls to P_2 in this period. The lower price P_2, in the third time period causes to reduce the production to Q_3. At the Q_3 production, demand remains greater than supply (D>S). Therefore price rises to P_1 again in the third period. This P_1 price in the fourth period raises supply again to Q_2. Thus the prices and production quantities movement follows the sequence as P_1Q_2,

P_2Q_3, P_1Q_2 ..... It goes on continuously without having tendency So reach at equilibrium.

Figure (ii) shows the Continuous or Peretual movements in prices and quantities of production by the curves P and Q respectively.

2) Convergent Oscillations or Cob-Web :

When the elasticities of demand and supply of production goods are different, it gives rise to convergent Cob-Web. In this situation elasticity of supply is less than demand. Price change affects supply relatively less than demand. The price and production quantities are adjusted in such a manner that which reach to equilibrium position, in the convergent type of Cob-Web, when economy is disturbed from equilibrium position, shows a tendency to regain equilibrium through a series of oscillation produced. Every succeeding fluctuation is more damped than the preceding one. The Cob-Web of damped oscillation is shown in the following figure (4.3)

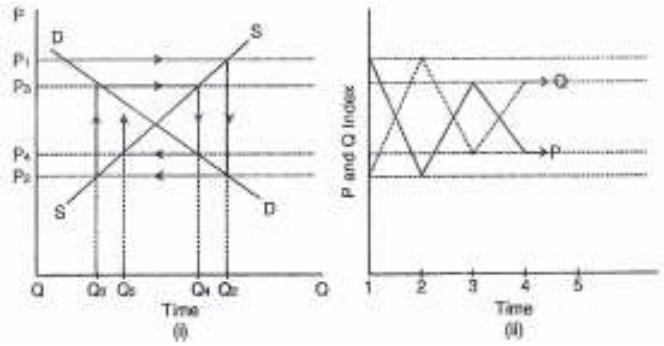


Fig. 4.3

Figure (i) shows the existence of convergent oscillations in prices and quantities of production, when the SS supply curve is less elastic than the demand curve DD. In the first time period P_1 price is prevailing therefore supply in the period second will be Q_2. It shows supply is greater than demand (S>D). Which leads to fall in price to P_2 in second period. Lower price P_2, causes lower supply Q_3 in third period. This causes larger demand than supply (D>S). So, it causes to increase in price to P_3 in the third period. Price P_3 leads to Q_4 supply in fourth period. In such a way fluctuations in prices and quantities of production are found more and more damped showing the sequence P_1Q_2, P_2Q_3, P_3Q_4, P_4Q_5 ..... finally price and production shows

a tendency to reach the equilibrium position. Figure, ii) reveals the damped fluctuations with the help of P and Q curves.

3) Divergent oscillations or Cob-Web :

When the demand curve is less elastic than supply curve, it produces the divergent oscillations regarding the price and production quantities. When price changes supply changes more than demand. The adjustment in prices and production quantities occur in such a way that price and supply continuously move away from equilibrium position. The amplitude of cycles (fluctuations) continuously increasing during the passage of time period.

The divergent Cob-Web is illustrated in the following figure. (4.4)

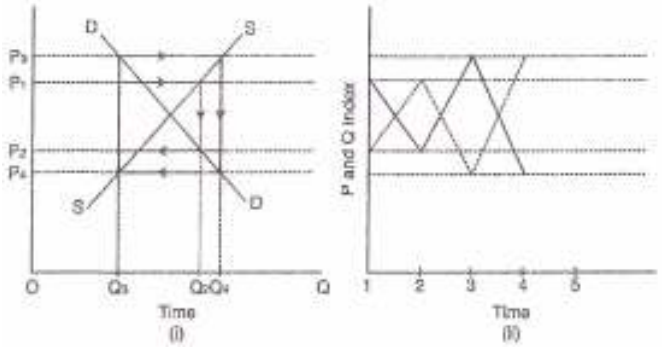


Fig. 4.4

Figure (i) exhibits the fluctuations in price and production quantity, which are divergent in nature. When the demand curve is less elastic than the supply curve, divergent type of fluctuations are borned, initial price P_1 gives rise to Q_2 supply in the next period, it reveals supply is greater than demand (S>D). Therefore price moves downwards to P_2 in the second period. The lower price P_2 Causes to fall in supply to Q_3 in the third period. Q_3 supply is less than demand, so price rises to P_3. increased price P_3 gives rise to increased production, so supply i.e. production rises to Q_4, in the fourth period. This rise in supply causes to fail in price, So price becomes P_4. Thus this rise and fall in price and production gives rise to divergent cob-web as P_1Q_2, P_2Q_3, P_3Q_4, P_4Q_5.....The economic cycles continuously moves away from the equilibrium position. Therefore they are referred as divergent cob-web. Figure (ii) reveals divergent oscillations by the P and Q curves respectively. The amplitude of fluctuations go on increasing during the passage of time.

Mathematical representation of Cob-web Model :

"Cob-Web model basically .assumes that demand in current period D_t is a function of current price P_t. The supply in current period S_t is a function of the price in the preceding time period P_t-1. When $D_t = S_t$ the equilibrium in economy is to be established. This relationship is expressed mathematically as follow.

$$D_t = x = bP_1 \qquad \text{..... (1)}$$

$$S_t = aP_{t-1} - 1Y \qquad \text{..... (2)}$$

and $D_t = S_t$ ..... (3)

where, X and Y are the quantity demanded and supplied, independent to price, b and a are the coefficients determining the slopes of demand and supply functions respectively:

Now put the equations (1) and (2) in equation (3). We get equation No. (4).

$$D_t = S_t$$

$$x - bP_t = aP_{t-1} - Y$$

$$bP_t = X + Y = aP_{t-1}$$

$$P_t = X + Y/b = (-a/b)\, P_{t-1} \qquad \text{.....4}$$

This is general equation for cob-web theorem. With the help of this genera! equation, we can formulate the relationship for various periods as follow.

$$P_1 = \frac{X+Y}{b} + \left(-\frac{a}{b}\right) P_0$$

$$P_2 = \frac{X+Y}{b} + \left(-\frac{a}{b}\right) P_1$$

Criticisms :

This theory is criticized as follows.

1) It is based on various assumptions :

This theory assumes pure competition existing in market, Also price is governed by supply, future production depends on current price etc. Out of these some assumptions are unrealistic and some are not wholly found true. The factors which are not considered by this theory are also responsible for the cyclical fluctuations.

2) This theory ignores the expections :

Future expections regarding the production and prices also cause the cyclical fluctuations. This theory says that future production depends on current prices, but production decisions are also influenced by the expected prices in the next time period. This theory ignores this expected prices. So, theory loses it's truthfulness.

3) Divergent cycles are not found in real world :

This theory says that divergent cob-web disturb the initial equilibrium between price and production (supply) in such a manner that infinite cycle of explosive fluctuations are produced. In reality such divergent fluctuations are not found any where. Therefore divergent cob-web is unreal.

4) Continuous cob-wed also not found in real world :

This theory says that continuous cob-webs or fluctuations are produced with regards to prices and production. In real world such type of cob-webs are also not found.

4.4.2 Hicks's Theory business cycle

Prof. J. R. Hicks has given his theory of business cycle in his book named 'A contribution to the Theory of trade cycle. He has formulated his theory of trade cycle with the help of the multiplier accelerator interaction. According to Hicks multiplier and accelerator are the two sides of the theory of fluctuations, just as the theory of demand and theory of supply are two sides of the theory of value. In Hicks' theory of business cycle multiplier, accelerator, warranted rate of growth of income, induced and autonomous investments are the main components play an important role in business fluctuations. The warranted rate of growth is the growth rate of economy at which rate of real investment is equal to the rate of saving in economy. The interaction between the multiplier and the accelerator causes economic fluctuations around the warranted rate of growth, which is the equilibrium income growth path.

Hicks' model is based on consumption function, an induced investment function, with a fixed accelerator and an autonomous investment. The consumption function shows a lagged income consumption relationship as

$$C_t = \alpha Y_{t-1}$$

i.e. consumption in period is regarded as a function of income (y) of the previous period (t–1).

Autonomous investment is not depend upon changes in level of income. So, it is not related to the growth of economy Induced investment depends on changes in the level of income. Therefore it depends upon the growth rate of economy. The induced investment plays a crucial role in Hicks' theory of business cycle, because the accelerator depends on it. According to Hicks the increase in income from one period to the next period leads to induced investment, which interacts through the multiplier. This is hicksian accelerators.

Assumption :

1) Hicks assumes a progressive economy in which autonomous investment is increasing at a constant or regular rate.
2) The saving investment coefficients are such that any displacement from equilibrium results in a movement away from equilibrium path leads to a Lagged movement.
3) Induced investment responds to changes in output with a time lag.
4) The full employment ceiling is a constraint on the upwards expansion.
5) The accelerator provides an indirect constraint on the down ward movement of the economy.
6) The multiplier and accelerator have constant values through out the different phases of the trade cycle.

Hicks' theory of business cycle is explained with the help of following figure 4.5.

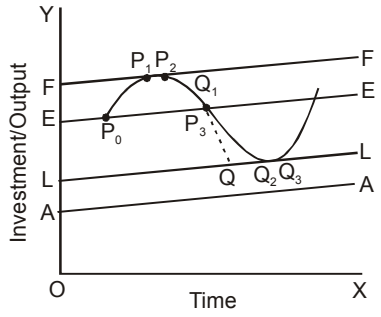


Fig. 4.5

In the figure above the line AA shows the path of autonomous investment growing at a constant rate. The line EE reveals the equilibrium path of output. Which depends on AA and is deduced by applying super multiplier to it. Line FF shows the

full employment ceiling level above the line EE. Which is growing at the same rate at which AA is growing. The line LL represents the lower equilibrium path output or the floor.

Now we can see how the acceleration effect results in cyclical fluctuation in income.

When there is increase in the rate of autonomous investment, it leads to an upward movement in income. P_0 is a noncyclical point on the equilibrium path. The autonomous investment causes the interaction of the multiplier and accelerator, so economy moves upwards expansion path from the point P_0 to P_1. This upswing phase is related to the standard cycle, which leads to explosive situation due to the given the values of multiplier and accelerator Income and output do not rise above the point P_1 due to the upper limit or ceiling set by the full employment level FF. When the economy reaches the full employment Ceiling at point P_1, it creeps along the ceiling to the point P_2 for some time of a period, and the downward movement does not start immediately. The economy moves along the ceiling point from the points P_1 to P_2 it depends on the investment lag. If investment lag is greater the economy will move along the ceiling path. Income at this level is falling as compare to the previous stage of the cycle. So the investment is decreasing. It leads to the downward movement of economy, it gives rise to downswing of the cycle.

The downswing movement is caused due to the reverse mechanism of the multiplier-accelerator. Fall in investment causes to reduce the income, in turn reduction in income causes further fall in investment and so on. Continuous working of the accelerator causes fall in output below the equilibrium level EE. This fall in output P_2P_3Q is steep one. During the dwonswing movement acceleration does not work quickly as in upswing movement. When the slump is very severe, induced investment falls to zero and accelerator co-efficient becomes zero. The Fall in rate of investment is equal to the rate of depreciation. Therefore the total amount of investment is equal to autonomous investment minus the constant rate of depreciation in economy. The fall in output is much gradual and the slump is much longer than the boom as shown by Q_1Q_2 Points. At the point Q_2 the slump reaches to the bottom line i.e. floor level as shown by line LL it can't fall below the point Q_2 and economy does not move upwards immediately from the point Q_2, but it moves along the lower equilibrium line LL up to the point Q_3 due to the prevelence of excess capacity in economy. When the all excess capacity is vanished, autonomous

investment causes to rise in income, which in turn leads to increase in induced investment. Induced investment causes to operate the functioning of accelerator with multiplier, so that the economy moves upwards to the ceiling line FF and again the upward cycle may emerge. Hence, the cyclical ups and downs are repeated in economy. They give rise to business cycles. Thus, Hicks has given satisfactory explanation . of turning point as well as the periodicity of the cycle. Since the system has an upper ceiling limit and a lower floor limit, output and income changes oscillates between these two limits alike pendulum of the clock.

Criticism :

The Hicks's theory is criticized on the following grounds.

1) 'Prof Kaldor' says that this theory uses crude and misleading acceleration principle. This theory assumes constant capital output ratio. In reality, capital output ratio is not constant but it is found to be variable.

2) This theory assumes continuous autonomous investment during the different phases at a steady pace in the slump period, it is found that autonomous investment falls below it's normal level So, this is unrealistic assumption.

3) Hicksian phenomenon of trade cycle is highly mechanical, in reality trade cycle movement can't take place mechanically as described by Hicks.

4) 'Duesenberry' and 'Lundberg' criticized this theory as Hick's distinction between autonomous investment and induced investment is not found feasible in practice. In short run every investment is autonomous and in longrun most of the autonomous investment becomes induced. Therefore it is difficult to distinguish between the autonomous investment and induced investment.

5) Hicks in his mode! says that full employment ceiling is independent of the path of output but critics say that full employment level depends upon the magnitude of resources available in country.

4.5.0 Structural Theories of Inflation :

4.5.1 Mark-up theory by Gardner Ackley :

Introduction:

The theory of mark-up inflation is mainly associated **with Prof Ackley, though formal models have also been** presented by Holzman and Duesenberry

independently each other. Now, we have to analyze the Ackely's simplified version of the markup inflation. Prof. Gardner Ackley puts lucidly the mark-up theory of inflation. He argued that it is totally wrong to attribute inflation exclusively either to demand or cost. Actually, inflation is caused both by demand-pull and cost- push supply factors. The demand-pull inflation is caused by excessive demand for goods and prices go up. As a result of this, costs too rise and prices go up. Sometime wages may rise without excess demand for the product. This means that at existing price level which has increased due to increase in the wages, but there is a shortage in the supply of goods.

Assumptions

Prof .Gardner Ackley laid down certain assumptions to put forth his views on mark up inflation in the following way.

1. Wages and prices are administered and settled by workers and business firms
2. Firms fix administrative prices for their goods by adding their direct material and labour costs and some standard mark up which covers the profits.
3. Labour seeks wages on the basis of a fixed mark up over its cost of living.

This model of inflation can lead to a stable, a rising, or a falling price level depending on the markups which firms and workers respectively use. If either or both use a percentage markup, the inflation will progress faster than if either or both fix the markup in money terms.

If each participant fixes prices on the basis of prices he pays, the inflation will be high and of long duration. If one firm raises its price in order to maintain its desired markup, the costs of other firms are raised which, in turn, raise their prices and this process of raising costs and prices will spread to other firms in an endless chain.

When consumers buy such goods whose prices are rising, their cost of living rises. This causes wage costs to rise, thereby increasing the inflationary spiral. However, the inflationary spiral may come to a halt, if there is a gradual improvement in the efficiency and productivity of labour.

A rise in efficiency and productivity means that there is a rise in wage rates or prices of materials leading to a smaller rise in labour and material costs. But stability in prices may not come if firms and workers appropriate the gains of rising

productivity by increasing their mark up if each participant increases its mark up by 100 per cent of the gains of productivity increase, the inflationary spiral might continue indefinitely.

According to Ackley, the mark up can be based on either historical experience or expectations of future costs and price. Moreover, the size of the markup applied by firms and workers is a function of the pressure of demand felt in the economy

When the demand is moderate costs and prices, and the price rise may be slow. But when eth demand is moderate, the markup may be applied to historically experienced costs and price rise may be slow. But when demand is intense, the markups are based on anticipations of future costs and prices rise rapidly. Thus there can be no inflation without some change in the size of the markup.

This theory can also be applied to cost-push and demand-pull models of inflation. If firms and workers believe that their markups are lower than the required costs and prices, regardless of the aggregate demand, they will increase the size of their markups.

Under such a situation, costs and prices rise in an inflationary spiral. This is similar to the cost- inflation. On the other hand, if firms and workers raise the markups due to increase in demand, markup pricing is related to demand-pull inflation.

To conclude with Ackely," Inflation might start from an initial autonomous increase either in business and labour markups. Or it might start from an increase in aggregate demand and which first and most directly affected some of the flexible market determined prices. But however it starts, the process involves the interaction of demand and market elements".

The markup inflation can be controlled by the usual monetary and fiscal tools in order to restrict the demand for goods and increase productivity. Ackly also suggests wage and price guidelines or an incomes policy to be administered by a national wage and price commission.

It's criticism:

Ackley's theory suffers from two weaknesses:

1. Limited explanation: The theory gives limited explanation of the cause of inflation, especially the motives which compel workers and firms to fix higher markups in the absence of demand conditions.
2. Continues indefinitely: It suffers from the implication that once inflation starts, it is likely to continue indefinitely when costs and prices rise in a spiral.

Conclusion:

Prof. Ackley viewed that a model of mark-up inflation in which both elements of demand and cost are responsible for inflation. Here, an increase in the demand resultant there is further increase in the prices. Hence, inflationary situation takes place due to either by excess commodity demand or by an autonomous increase in the wage rates. According to him too suggests that average level of mark-up used by the firms tends to rise as total demand for goods increase and vice versa. Similarly, the mark-up that unions supply to the cost of living in setting their wage rate demand also tends to rise and fall as volume of employment respectively rises and falls. Finally total demand and cost contributes to inflation, but to control it the Monetary and Fiscal, Policy is useful tool to tackle the inflationary situation.

4.6 The Phillips Curve- The Relation between Unemployment and Inflation

Background: The actual empirical evidence did not fit well in the simple Keynesian macro model. A renowned British Economists, A. William Phillips published an article entitled "Relation between Unemployment and Rate of Change in Money Wages in the United Kingdom, 1861-1957" in *Economica* in 1958. His article was based on good deal of research using historical data from UK for about 100 years in which he arrived at the conclusion that there in fact existed an inverse relationship between rate of unemployment and rate of inflation.

Meaning of Phillips Curve

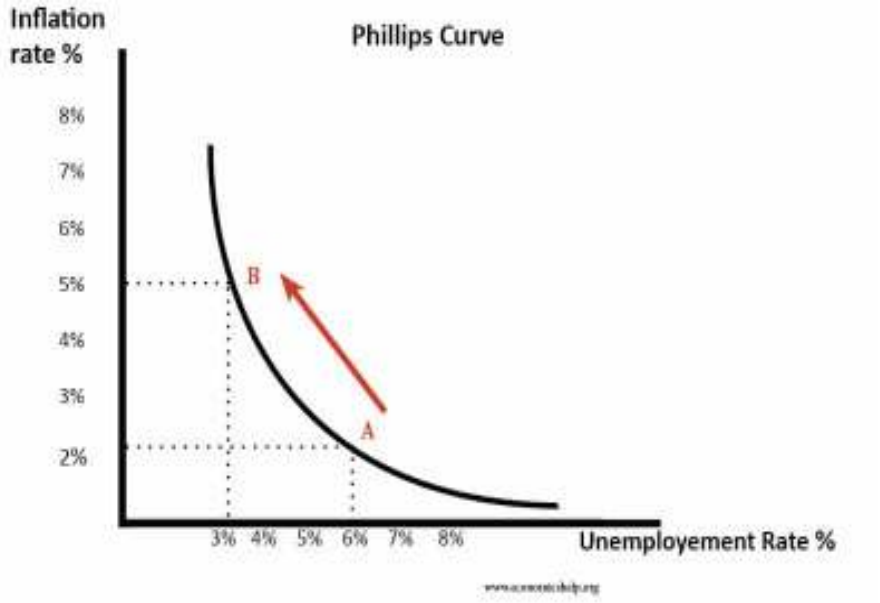
The Phillips curve states an inverse relationship between inflation and the unemployment rate, i.e., the higher the economy's inflation rate, the lower the unemployment rate will be, and vice-versa. This economic concept was developed by William Phillips and proven in all major world economies.

Explanation of the Theory

The statistical relationship between unemployment and price inflation was coined by Prof. William Phillips. The Phillips curve describes an inverse correlation between inflation and unemployment. It says that as inflation rises, unemployment goes down, and vice versa. The Phillips curve has been an important decision-making tool in the Federal Reserve's interest rate adjustments. For several decades, decision-makers have included the Phillips curve in their efforts to maintain maximum sustainable employment and stable prices. In addition to guiding fiscal policy, the Phillips curve can predict inflation's future direction of change 60 per cent to 70 per cent of the time. This helps the Federal Reserve and central banks understand where the economy is likely going so that they can use their available tools to stimulate or slow the economy as needed. As an economic model, the Phillips curve states that falling unemployment will cause inflation to rise or that rising inflation will reduce unemployment. While this may intuitively make sense, since more money in workers' pockets means more dollars spent in the economy, the theory has not consistently played out as expected.

Phillips curve represents the economic relationship between the rate of unemployment and the rate of change of money wages. It indicates that wages tend to rise faster when unemployment is low. In "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957, Phillips found that, except for the years of unusually large and rapid increases in import prices, the rate of change in wages could be explained by the level of unemployment. Simply put, a climate of low unemployment will cause employers to bid wages up in an effort to lure higher-quality employees away from other companies. Conversely, conditions of high unemployment eliminate the need for such competitive bidding; as a result, the rate of change in paid compensation will be lower.The main implication of the Phillips curve is that, because a particular level of unemployment will influence a particular rate of wage increase, the two goals of low unemployment and a low rate of inflation may be incompatible. Developments in the United States and other countries in the second half of the 20th century, suggested that the relation between unemployment and inflation is more unstable than the Phillips curve would predict. In particular, the situation in the early 1970s, marked by relatively high unemployment and extremely high wage increases, represented a point trade off the Phillips curve.

Diagram 4.1



In diagram 4.1 Phillips emphasised on trade-off between unemployment and inflation rate. He found inverse relationship between unemployment and inflation rate. Increase in inflation rate at 5 per cent leads to less unemployment and when inflation rate is slow down at 2 per cent which leads to increase in unemployment at 6 per cent. It clearly shows that employment creates inflation in the economy. Phillips curve shown inverse relation between unemployment and rate of inflation in UK‘s economy.

Example of the Phillips Curve

Let us take an example of the Phillips curve. In the Phillips curve, the opposite correlation between the inflation in a country’s economy and unemployment is portrayed as the downward sloping curve. For example, if the unemployment rate in the economy is 6 per cent, then the inflation rate is 3 per cent. According to the Phillips curve, if the unemployment rate decreases from 6 per cent to 5 per cent, the inflation rate will increase to 3.5 per cent. Therefore, the effect of an increase or decrease in the unemployment rate on inflation is predictable as inverse relation.

Conclusion

The Phillips curve developed by William Phillips states that inflation and unemployment have a stable and inverse relationship, i.e., higher the economy’s

inflation rate, lower the unemployment rate, and vice-versa. The theory of the Phillips curve claims that economic growth comes from inflation. As a result, it should increase more jobs and less unemployment. Alternatively, focusing on decreasing unemployment also increases inflation.

However, the original concept by William Phillips was proved wrong when the stagflation occurred in the 1970s. At that time of stagflation, both the inflation and unemployment rates were high. So, the implications of the Phillips curve are appropriate only in the short term.

4.7 Summary

Business cycles are called trade cycles. Business cycles means regularly ups and downs in business activities. Some times, income employment, production, demand supply etc. factors are rising up to a point and then it fall to a bottom point. It is called economic prosperity and economic depression. There are various definitions given by various economists by considering different factors. There are four phases of business cycles. There are various reasons causing the business cycles, so there are various theories of business cycles given by various economist. Following are some important theories viz. Hick's theory and Cobweb theory of business cycles.

Generally inflation means rising prices. But the question is why the price in the economy were happens to rise has been explained by many economists as wellas scholer as per their analysis. In this junction we get idea differently from different economists. According to Fisher, Friedman, Keynes have discussed through monetary approach. They viewed that quantity of money is the only factor which forces to change in the price level.

Structural theoriorists like Ackley and Eckstein argued that due to changes in the structure of the economy price level changes.

Some of the economist have argued demand - pull and supply - push factors causes for inflation. Finaly, Phillips curve described the relation of inflation and unemployment which has resulted due to monetary policy.

4.8 Key words / Terms to Remember :

i) Trade - off = It is a situation where one thing is increasing and other one is decreasing.

ii) Velocity = speed

iii) bank credit = credit money

iv) Mark - up = addition, margin

v) Bottle - neck = shortage

4.9 Questions For Self Study

(A) Answer in one sentence.

1) Which is the type of Phenomenon of Trade Cycle?

Ans :

1) Monetary Phenomenon

(B) Fill in the blanks.

1. Business cycles are also known as .....
2. There are ..... phases of Business cycles.
3. Cob-web theory is given by .....
4. Hicks theory of business cycles also considers ..... interaction.
5. The Phillips Curve is a graphical depiction of the---
   a) Positive relationship between inflation and output
   b) Negative relationship between inflation and the CPI
   c) Negative relationship between inflation and unemployment
   d) Negative relationship between unemployment and output.
6. An increase in unemployment benefits is expected to--------
   a) Increase the unemployment rate in the short run but not in the medium run.
   b) Increase the inflation rate in the short run but not in the medium run.
   c) Increase the inflation rate both in the short run and in the medium run.
   d) Decrease the unemployment rate in the short run but not in the medium run.
7. Inflation means-------
   a) Always reduces the cost of living
   b) Always reduces the standard of living
   c) Reduces the price of products
   d) Reduces the purchasing power of money

8. A. William Phillips published an article in ------year

   a) 1958 b) 1960 c) 1957 d) 1860

9. The Phillips curve states an inverse relationship between inflation and the----

   a) Wages Rate b) Employment Rate

   c) Unemployment rate d) Prices Level

Ans. 1) Trade cycles

2) Four

3) Henery Schultz, Jan Tinbergen and Arthur Hanau

4) Multiplier accelerator

5) a) Negative relationship between inflation and unemployment

6) b) Increase the inflation rate in the short run but not in the medium run.

7) d) Reduces the purchasing power of money

8) a) 1958.

9) c) Unemployment rate

C) State True and False.

1. Samuelson in his theory of business cycles considers only multiplier effect.
2. There are five stages of Business cycles.
3. Cob-web theory has given three types of occilliations.
4. Business cycles are found only in short-run.
5. Convergent occiliations means the occiliations going towards centre.

Ans. : 1) True 2) False 3) True 4) False 5) True

4.10 Exercise :

(A) Questions for Long Answers

1. Explain the Samuelsons theory of Business cycles.
2. State Hicks theory of Business cycles.
3. Explain the cob-web theory of business cycles.
4. Explain three possibilities of Net Investment given by Goodwin.
5. Explain the Phillips Curve

6. **Short Notes :**
   (i) Features of Business Cycles
   (ii) Phases of Business Cycles
   (iii) Unemployment and inflation

(B) Questions for Short Answers

1. Discuss the Mark-up theory by G. Ackley.
2. Explain the theory of Bottle - neck by Otto Eckstein.
3. Discuss the relation between Unemployment & Inflation.

4.11 Reference for further study :

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